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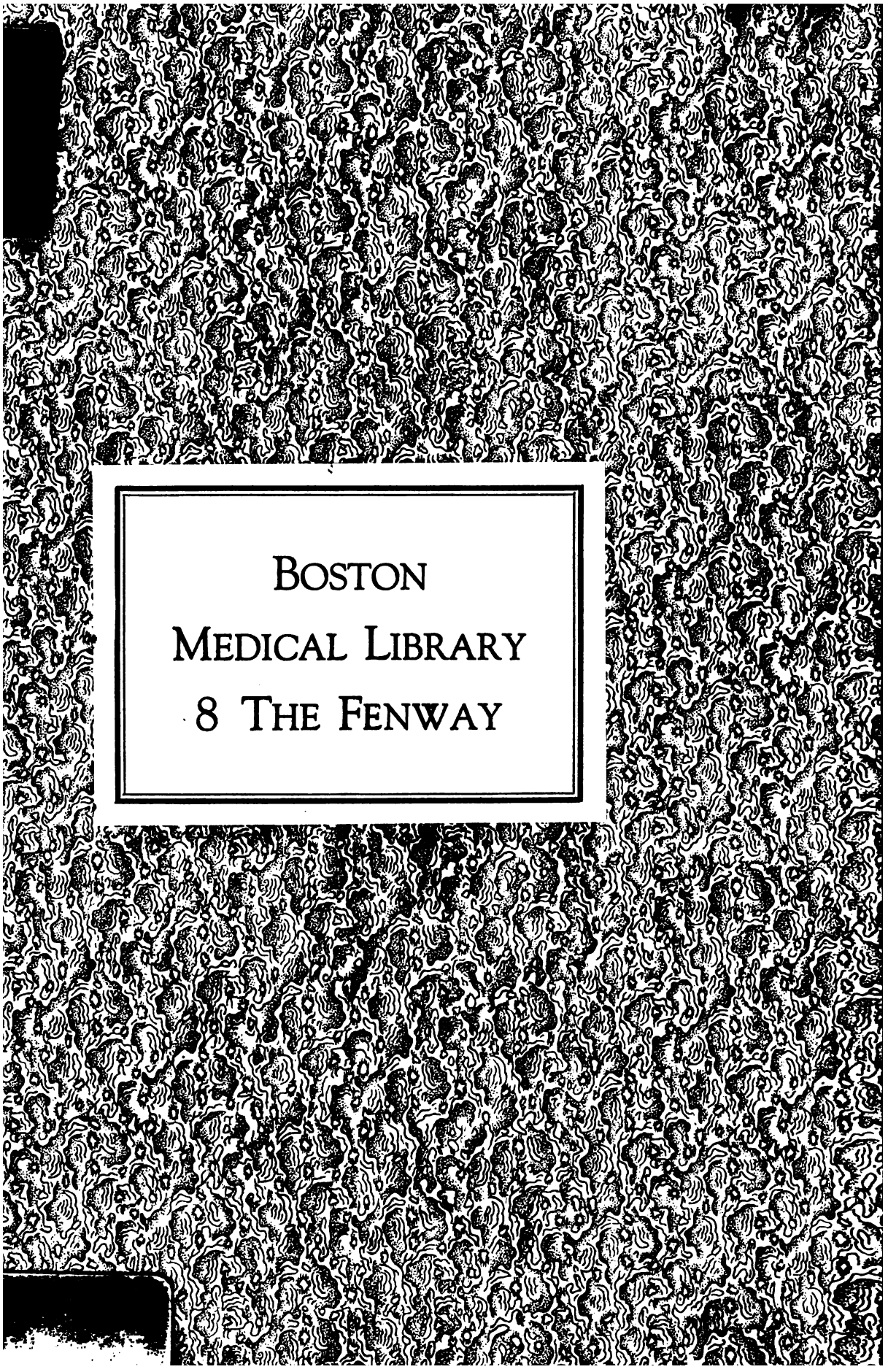
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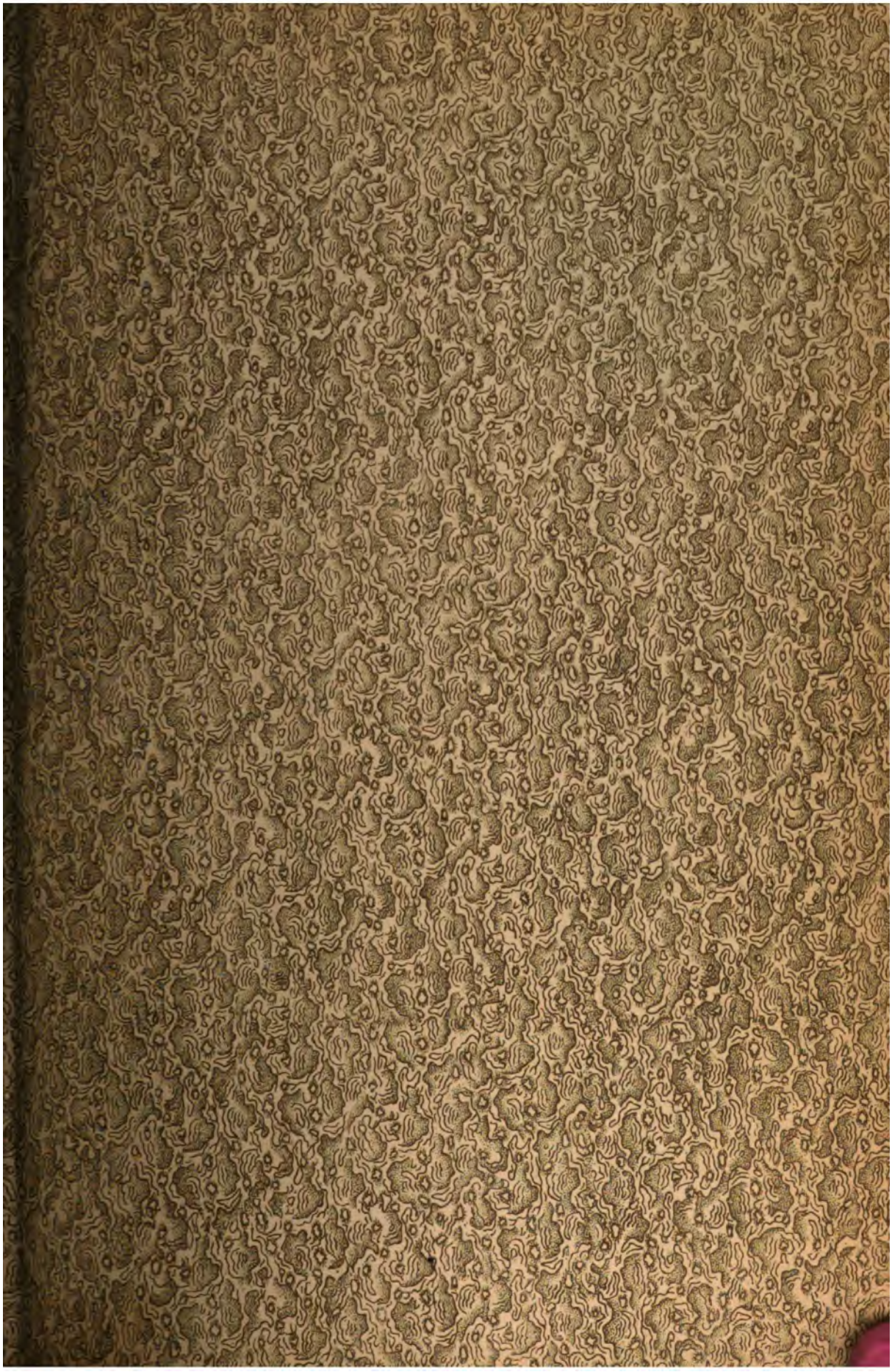

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Original Communications.

PROPHYLACTIC HYGIENE.

LECTURE V.—ON DISINFECTANTS.*

By Professor Dujardin-Beaumetz, Paris, France.†

GENTLEMEN:—I intend to-day to take up the important question of disinfectants. This is a vast subject, which I shall be obliged to limit to what pertains to prophylactic hygiene properly so-called. Do not, then, expect of me a description of all the antiseptics which might be included under the general head of disinfectants. Already, in previous lectures, I have presented certain general considerations on antiseptics, and I must refer you to these lectures.‡ Do not expect of me, moreover, an enumeration of all the processes which modern surgery and medicine utilize in antisepsis. Here, too, I must refer you to works which have been published on this subject, and which are now sufficiently numerous to constitute a whole library, and, in particular, to the fine work of Vallin on "Disinfection and Disinfectants," and to the treatise, so complete and interest-

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

† Member of the Academy of Medicine, Physician to Cochin Hospital, etc, Paris, France.

‡ "New Medications," chapter on "Antiseptic Medication," Am. ed., p. 112.

ing, which my pupil, Le Gendre, in conjunction with Lepage, and Barrette, have published on "Antisepsis in its Application to Therapeutics and Hygiene." *

I will confine myself, then, to disinfection as applied to the prophylaxis of infectious diseases, and to the disinfectants suitable to use in such cases. We shall have, successively, to examine the means most practical and useful to put in operation for the disinfection of the habitations and rooms occupied by patients, the objects which have been in contact with them and soiled by their dejections, and, lastly, such agencies as should be employed to prevent the propagation of the disease by persons who have been near the patients: in a word, all the means which are effectual in arresting contagion, and the spread of epidemic and contagious diseases.

We must, first of all, have a clear idea as to the meaning of this word *disinfectants*. The definition which Littré gives cannot now be accepted. According to this authority, "Disinfectants are substances which chemically destroy bad odors;" such substances are *deodorizers*, not *disinfectants*. Vallin's definition is the only acceptable one; one of the terms of this definition being modified: "Disinfectants are substances capable of neutralizing the morbific principles,—viruses, germs, miasms,—or of decomposing fetid particles and gases set free from matters in putrefaction." If you will replace the word *substance* by the word *agent* this definition will be complete, as this slight change enables us to include among our disinfectants heat, the very best of disinfectants. As far as concerns my present purpose, and in accordance with the rather limited plan of this course of lectures, I shall speak of disinfectants simply as agents which oppose infection,—that is to say, the propagation and dissemination of the pathogenic microbes of infectious diseases.

Shall we make a distinction between antiseptics and antivirulents, as Vallin proposes? The former arrest putrefaction, in accordance with the meaning of the Greek word from which they are derived (ἀντισηψις); the latter address themselves more particularly to the microbe-agents,—virus, germs, contagion. I do not think such distinction necessary, for we know to-day that putrefaction is determined by microbes, and, consequently, these two classes should make but one. It is also understood that we exclude from our definition absorbents and deodorizers, as the kinds of action denoted by these words may go on without destroying the agent of contagion. A disinfectant may be both an absorbent and a deodorizer, but the converse is not always true.

Having settled the matter of definition, we can now study the agents of disinfection. If we keep ourselves strictly within the limits laid down at the beginning of this lecture,—*i.e.*, on the ground of prophylaxis,—the number of the agents necessary to consider is very restricted. We have not, in fact, to take up in this lecture all the agents of medical or surgical antisepsis, but our task should be to set forth as briefly as possible those that oppose the transmission and spread of infectious diseases. We may arrange them under two heads,—chemical agents and physical agents. The first may be divided into gaseous and liquid disinfectants. Let us examine the first of these groups,—the gaseous fumigations.

A priori, it would seem that the type of disinfectants must be a gas endowed with a very intense force of penetration, and which is capable by this very fact of bringing its antiseptic action to bear upon all parts—the most hidden and remote as well as the most exposed—of the apartment undergoing disinfection. You will see, on the contrary, that there is now a tendency to abandon these gaseous disinfectants, and to adopt the conclusion of Richard, expressed in the following words: "We are obliged to distrust the chemical gaseous disinfectants in general. We must tax ourselves to find more reliable agents, and to dispense with gaseous disinfectants in future." †

The gaseous disinfectants are nitric acid, hydrochloric acid, chlorine, and sulphurous acid. I will pass very rapidly over the first two, because they are no longer used in medicine or surgery. I shall allude briefly to chlorine, having considerably more to say about sulphurous acid, the only gaseous disinfectant much in use to-day.

It was Smith, of England, who first introduced fumigations of nitric acid into hygiene. He practised these fumigations from 1795 to 1799 on the English fleet, then decimated by an epidemic of typhus, and the results were so advantageous that Parliament voted him in 1802 a bonus of one hundred and twenty-five thousand francs (twenty-five

* Le Gendre, "Traité des désinfectants et de la désinfection." Paris, 1882. Le Gendre, Barrette, et Lepage, "Traité pratique d'antisepsie appliquée à la thérapeutique et à l'hygiène." Paris, 1888.

† Richard, "On the Practice of Disinfection by Sulphurous Acid" (*Revue de Hygiène*, p. 273, 1887).

thousand dollars). To obtain nitric vapors according to the process of Smith, sulphuric acid was made to act on saltpetre.

In these fumigations care was taken that the nitric acid should be entirely free from nitrous vapors. It is the very opposite which should have been sought for, if we may trust the recent publication of Girard and Pabst,* who have maintained, as the result of their researches, that these nitrous vapors have an extreme antiseptic power, and they have proposed for disinfectant purposes the nitrous vapors which are set free by the crystals of the leaden chambers, the sulphate of nitrosyle. These crystals are saturated with sulphuric acid, and the mixed vapors liberated. Unfortunately, these nitrous vapors, which possess true antiseptic properties, have also a marked corrosive action, and are, consequently rather inapplicable to the purification of garments and draperies.

Guyton Morvaux was the first to propose fumigations by hydrochloric acid and chlorine, the latter being styled, in accordance with the older phraseology, oxygenated muriatic acid. To-day, if the first are abandoned, the latter are retained, under the name of Guytonian fumigations. In strict fairness, however, the merit of proposing these chlorine fumigations should be ascribed to Cruickshanks, or, rather, to a French physician, Dizé, who employed them as early as 1773.

These fumigations of chlorine, which Guyton substituted for the fumigations of nitric acid, had a great popularity, which, however, was not completely merited, if we may trust recent researches. I refer to experiments which have been made in France by Peuch, of the veterinary school of Toulouse, and abroad by Dougall, Baxter, Mecklemburg, and Sternberg. The latter undertook a very important investigation of this subject at the instigation of the National Board of Health of Washington. All these experimenters have studied the antiseptic action of chlorine on virulent matters, and particularly on vaccine. They have shown that the fumes of chlorine destroy the inoculability of vaccine, but they have not precisely indicated the quantity necessary to obtain this result. At the same time, Sternberg, who has given much greater exactness to his experiments, has shown that ivory-points charged with dried vaccine, and exposed for six hours to an atmosphere containing one per cent. of chlorine, lose their virulent properties.†

I hardly need tell you how chlorine is obtained. This gas is evolved by the action of hydrochloric acid on binoxide of manganese, or by the decomposition of the alkaline chlorides, of lime or sodium (Labarraque's solution), or from Javel's solution (of hypochlorite of potassium), and I pass now to a subject which demands of us considerable attention. I refer to the disinfectant action of sulphurous acid.

The disinfectant properties of sulphurous acid have been known from the most remote antiquity. Open your "Odyssey," and, at the latter part of Book xxii., you will read that Ulysses, after the massacre of the suitors and slaves, purified his palace with burning sulphur.‡ Ovid, in chapter iv., of his "Fasti," recommends the shepherds "to sprinkle the lustral water over their flocks, and to throw upon the fire the virgin sulphur, which gives an azure flame."

But the particular writer of antiquity who has the most to say respecting the antiseptic properties of sulphur is certainly Pliny. He tells us that in the island of Milo there exists an excavation whence issue sulphurous vapors. When epidemics prevail in the island, the inhabitants enlarge this excavation, in order that the sulphurous vapors may be more abundant, and penetrate the houses and purify the country.

But let us come down to a more modern period, and examine on what experimental bases is established the antiseptic value of sulphurous fumigations. These experiments, relatively recent, have all pertained to the destruction of the virulent properties of certain products, or to the sterilization of certain micro-organisms.

In the work of Sternberg, which I have already mentioned, he has given considerable prominence to sulphurous acid, and has shown that the combustion of five grammes per cubic metre of sulphur sterilizes vaccine in the liquid state, and that it is necessary to increase the quantity to sixteen grammes to effect the sterilization of dried vaccine.§

* Girard and Pabst, "Disinfection of Sewers and Cesspools by Nitrous Vapors" (*Acad. des Sciences*, 1880).

† Sternberg, "Experiments designed to Test the Value of Certain Gaseous and Volatile Disinfectants" (*National Board of Health Bulletin*, Washington, 1880, vol. i. p. 219, and 1881, p. 21).

‡ "With fire and sulphur, cure of noxious fumes,
He purged the walls and blood-polluted rooms."
Pope's translation of Homer's "Odyssey."

§ Sternberg, "Experiments designed to Test the Value of Certain Gaseous and Volatile Disinfectants" (*National Board of Health* (Washington) *Reports*, vol. i., 1880, and also the report for 1881).

Baxter made trials with sulphurous acid to ascertain its antiseptic action on the virus of glanders. His observations, however, are far from being conclusive, as he directly mixed his sulphurous acid, in aqueous solution, with the substance which he wished to inoculate. Vallin's experiments seem to be far more conclusive. He also made use of farcy-virus, and showed that twenty grammes per cubic metre of sulphur sufficed to neutralize this virus. Then, extending the experiment to tuberculous virus and to the pus of soft chancre, he gave a clear demonstration of the antiseptic effects of the sulphurous acid.*

Pettenkofer also made some experiments during the fall of 1875, which seemed sufficiently conclusive to justify henceforth the employment of sulphurous acid in the disinfection of contaminated ships. Thus far all the experiments seemed particularly favorable to sulphurous acid.

Two physicians of the Russian marine brought into doubt the affirmations of the Munich professor. They operated on microbes, and showed that the neutralizing action of sulphurous acid varied according to the height at which they placed the micro-organisms in the room undergoing disinfection; and while there were needed but twenty-eight grammes of sulphur per cubic metre when the microbes were placed on the level of the ground, it was necessary to increase the quantity to ninety-two grammes when they occupied an elevated position in the room.†

But the experimental researches which most seriously shook confidence in the antiseptic qualities of sulphurous acid were those of Wolffhügel, of Berlin. Operating in different conditions on micro-organisms, and, in particular, on those of charbon, he showed that the proportion of 10 volumes per 100 of sulphurous acid was not sufficient to destroy the morbid germs, especially when they were in a state of desiccation; hence he was led to consider sulphurous acid as an unreliable disinfectant.‡

Two years after, in 1884, being charged by the Prefect of Police with the task of organizing a system of disinfection applicable to cholera, which had then just broken out in France, I undertook, in my turn, the investigation of this subject, although from a somewhat different stand-point. Desirous, also, of studying the question in its most practical and economical aspects, with the co-operation of MM. Pasteur and Roux, I instituted at the Cochin Hospital a series of experiments to determine the disinfectant value of sulphurous acid.§

These experiments seemed to me rather favorable than unfavorable. We saw our tubes containing cultures of micro-organisms or of vaccinal lymph, sterilized by the combustion of twenty grammes of sulphur per cubic metre, while we found that forty grammes destroyed the virulence of dried vaccine. At the same time, even amid the combustion of twenty grammes per cubic metre, the bacteria of anthrax in a culture-broth were not sterilized. I shall return to all these points when I come to speak of the means to put in practice to utilize to the best advantage sulphurous fumigations.

But long before such experimentation had been thought of, sulphurous fumigations had been applied to the disinfection of contaminated places. Rendered obligatory in the army, these fumigations have been employed since 1880 by our military *confrères*. We have seen Czernicki at Avignon, Geschwin at Romorantin, André at Lunéville, Aubert in 1881 at Elbeuf, then at Evreux in 1884, arrest epidemics by means of these sulphurous fumigations.‖ The quantity of the sulphur employed varied from twenty to thirty grammes per cubic metre. Inspector-General Legouest confirmed these results, for, after my communication to the Academy of Medicine, he declared that these fumigations had rendered incalculable service to our army. The same

* Vallin, "Disinfectants and Disinfection." Paris, 1882.

† Schotte und Gaertner, "Wie viel Carbolsäure oder wie viel Schwefligesäure in Gasform ist nöthig zur Tödtung kleinsten Lebens?" (*Deutsche Viertelj. für öffentliche Gesundheitspflege*, 1880, t. xii. pp. 337 à 376, and *Revue d'Hygiène et de Police Sanitaire*, 1880, p. 819).

‡ Wolffhügel, "Ueber den Werth der Schwefligen Säure als Disinfectionsmittel" (*Mittheilungen aus dem Kaiserlichen Gesundheitsamte*, Berlin, 1882, vol. i. p. 124; and *Revue d'Hygiène*, March, 1882).

§ Dujardin-Beaumetz, "Expériences sur la désinfection des hôpitaux ayant été occupés par des malades atteints de maladies contagieuses" (*Académie de Médecine*, September 9, 1884, and *Bulletin de Thérapeutique*, t. cvii. p. 241, 1887).

‖ Czernicki, "Note sur l'assainissement du quartier du Palais, à Avignon, au moyen de l'acide sulfureux" (*Rec. des Mémoires de Médecine et de Pharmacie Militaires*, Décembre, 1880, t. xxxvi. p. 513). Aubert, "Sur l'assainissement de la caserne du 28e de ligne, à Elbeuf, au moyen de l'acide sulfureux" (*Bulletin de Thérapeutique*, 1884, t. cvii. p. 304); "Nouvelles expériences sur la désinfection des habitations privées ou publiques avec l'acide sulfureux" (*Bulletin de Thérapeutique*, 1886, t. cx. p. 397).

success had been attained in the navy, and Potier and Raoul, physicians of the marine, have both affirmed that disinfection by sulphurous acid had always proved efficient.*

The same good results had been attained in asylums and prisons. Pietra-Santa, in 1853, during an epidemic of smallpox, which broke out in the prison of the Madelonnettes and at the Santé, procured disinfection by sulphurous fumes; and Lailler, in 1878, disinfected by the same means the wards of the Asylum Quatremares.†

In 1884, during the cholera epidemic, squads of disinfectors, placed under the orders of the Prefect of Police, employed the sulphurous fumigations throughout all the department of the Seine, and the results were as satisfactory as could be desired; the method is still in usage in the department.

Despite this incontestable series of successes, we have lately seen Richard, in his important communication—"On the Practice of Disinfection"—to the Congress of Hygiene, discard the sulphur fumigations, which he considers as unreliable and insufficient, and he is supported by Loeffer, of Berlin, and Debroslawin, of St. Petersburg, and such has been the influence of this condemnatory judgment, that in both these countries sulphurous acid is now not as much as mentioned among the disinfectants for ordinary use.‡

How are we to understand such conclusions, when we consider the facts just mentioned? Is it the effect of the mere caprice of the day, or is it the result of thorough experimental testing? I believe, gentlemen, that we may easily explain the success and the want of success of the sulphurous fumigations by the extreme diffusibility of this gas, which is certainly one of its great advantages, but also gives rise to serious disadvantages.

My explanation is this. If you introduce sulphurous acid into a perfectly tight apartment, it is an excellent antiseptic, especially if you take into consideration that it has but little action on the furniture of the apartment, and its force of penetration is so great, as I have many times witnessed, that it will permeate the interior of upholstery and mattresses. But let the room be imperfectly closed (or, as we may say, too well ventilated), you readily understand with what extreme facility this gas will escape, and that the quantity of sulphurous acid introduced into the room may never be sufficient to have a thorough antiseptic action.

It results from this that the success of the sulphurous fumigations in the disinfection of apartments depends on whether the room is tightly closed or not. Energetic and certain when you have care to stop all the chinks and crevices of the apartment, these fumigations become uncertain and unreliable when there are numerous apertures by which the gas may escape.

I have, moreover, had a certain proof of this fact in my applications to the treatment of pulmonary affections of the sulphurous inhalations proposed by Sollaud and Auriol. I was obliged to paper carefully the walls of the apartment in which the sulphurous fumes were liberated, so great was the diffusion of the gas through the various chinks in those walls, our barracks being used for this purpose. You will find mention made of these facts in the thesis of my pupil Dariex, "On the Treatment of Pulmonary Tuberculosis by Inhalations of Sulphurous Acid."§

Is this a sufficient reason for the abandonment of sulphurous fumigations? By no means, gentlemen, and I believe, on the contrary, that they deserve a high place among our disinfectant agents. The experiments which I am undertaking at the present time to decide definitely the antiseptic value of gaseous disinfectants, experiments to be embodied in the thesis of my pupil Dr. Gaillard, will enable me, I am persuaded, fully to maintain the position which I have held with regard to these fumigations. The reasons which militate in their favor are the following: They are easy of application, they are economical, and they may be put in use without altering or destroying the draperies and the furniture of our apartments. In the second part of this lecture I shall tell you how you are to proceed in order to obtain from these fumigations the utmost possible effect, and I pass now to the study of liquid disinfectants.

From our stand-point of prophylactic hygiene, we have to consider only the liquid

* Raoul, *Archives de Médecine Navale*, 1885, t. xliii. p. 280; Potier, *Archives de Médecine Navale*, 1886, t. xlv. p. 426.

† Pietra-Santa, "De la désinfection par l'acide sulfureux" (*Bulletin de Thérapeutique*, 1884, t. cvii. p. 266).

‡ "Congès international d'hygiène et de dérmiographie," Vienne, 1887. Seizième question.—Richard, "La Pratique de la désinfection;" Loeffer, "Ueber Praxis der Disinfection;" Dubroslawin, "Ueber die raktischen Methoden der Disinfection;" Richard, "Désinfection par l'acide sulfureux" (*Revue d'Hygiène et de Police Sanitaire*, 1887, pp. 273, 333, 842).

§ Dariex, *Thèse de Paris*, 1887.

disinfectants which may, by their antiseptic action and the facility with which they may be employed, be utilized in practice; this very materially reduces the number of disinfectants demanding our present attention. I shall, then, take up in this connection only those the most widely used,—carbolic acid, chloride of zinc, the sulphates of copper and iron, and corrosive sublimate. Let us begin with carbolic acid.

The same kind of disagreement which we have seen to prevail respecting the antiseptic value of sulphurous acid seems to exist in reference to phenic acid, which has been considered by some as a very powerful antiseptic, and by others as a very unreliable disinfectant, and both views have been based on experimental researches, which, as has been the case with all antiseptics, have been of three sorts. One class of experimenters have noted the quantity of phenic acid which prevents the putrefaction of solid or liquid substances; another class have studied the neutralizing action of this acid on different kinds of virus; a third, carrying the investigation still further, have examined not only the action of phenic acid on the sterilization of culture-broths, but also on different microbes. I have not time to bring before you these experiments in their entirety, and must refer you therefor to Vallin's very complete work, and to the article which Pecholier has devoted to phenic acid in the "Dictionnaire Encyclopédique."

It seems demonstrated by all these researches that three per cent. solutions of phenic acid destroy most micro-organisms, and this is the conclusion of the recent work of Gaertner. It is also the result at which Dougall has arrived,* and Baxter, who finds that vaccinal lymph loses its virulent properties when mixed with a two per cent. solution of phenic acid.

But this antiseptic action can be but transient, if we may trust the experiments of Dougall. This authority affirms that phenic acid is not a disinfectant, but rather an antiseptic, which preserves and embalms organic matter, arrests momentarily and prevents fermentation and putrefaction, but, as soon as it is volatilized, it allows virulent matters to regain all their activity. This view is shared by Béchamp, who considers phenic acid as having a suspensive rather than a destructive action.† Parke is of the same opinion. "Carbolic acid," he says, "suspends but does not destroy the fermentation of organic matters." Pettenkofer considers carbolic acid as coagulant rather than disinfectant, and, according to him, it is chiefly in precipitating albumen that this acid acts. This view is shared by Gosselin and Bergeron, who have shown that it takes eleven per cent. of phenol to prevent the putrefaction of the blood.

Miquel, in his writings on disinfectants, places carbolic acid in the third group, among substances strongly aseptic,—that is to say, among those that, in the quantity of from one to five grammes, sterilize a litre of culture-broth. If you will refer to the table which I have given of these different antiseptics in my "New Medications,"‡ you will see that the figure of antisepsis of phenic acid for a litre of broth is 3.20 grammes, while that of chloride of zinc is 1.90 grammes, that of sulphate of copper .90 centigramme, and that of biniodide of mercury .025 milligramme, an estimate which places carbolic acid rather low down in the scale of antiseptics.

Can we place any more confidence in the vapors liberated by phenic acid? Still less, and the experiments of Schotte and Gaertner have shown that it needs a quantity superior to fifteen grammes per cubic metre to destroy bacteria.§

What has largely contributed to the popularity of carbolic acid is its odor. The common people think that every powerful disinfectant must have a strong smell, and where the smell is wanting they are inclined to ascribe but little virtue to the disinfectant.

To conclude what I have had to say under this head, I am disposed to adopt the judgment of Vallin respecting carbolic acid: "Carbolic acid neither merits the extravagant praises nor all the disparagements which it has received; it is a fairly good antiseptic," I will add, when used in large quantity.

Of late, phenic acid has had quite a powerful rival in cresylic acid, which is a phenol contained, like phenic acid, in the creasotes of coal-tar. This cresylic acid, which is also called cresylol and cresol, presents three isomeric states,—*ortho*, *meta*, and *para*,—but

* John Dougall, "Carbolic Acid and Zymotic Diseases" (*Lancet*, August 30, 1873).

† Béchamp, "Observations on Antiseptics" (*Montpellier Médical*, November, 1875, January and February, 1876).

‡ Dujardin-Beaumetz, "New Medications," Am. ed., Detroit, chapter "Antiseptic Medication."

§ Schotte und Gaertner, "Wie viel Carbolsäure oder wie viel Schwefligesäure in Gasform ist nöthig zur Tödtung kleinsten Lebens?" (*Deutsche Viertelj. für öffentliche Gesundheitspflege*, 1880, t. xii. pp. 337 à 376).

it is the ortho that predominates in the mixture. When cresylic acid is employed in a state of purity it is found to possess very energetic antiseptic properties, as recent experiments in my laboratory, and recorded in the thesis of my pupil Delplanque, have indicated.*

Delplanque has shown that the fermentation of urine is prevented by a two per cent. solution of cresylol, while carbolic acid in the same strength retards without preventing fermentation. In experimenting with cultures of the bacillus of typhoid fever, of cholera, of the pyocyanic bacillus, and of the bacillus of green diarrhœa, he has shown that solutions of one per cent. and of two per cent. retard the development of these bacilli, and that solutions of two per cent. also arrest all cultures of these pathogenic micro-organisms, or, in other words, twenty grammes per litre of cresylic acid oppose the development of micro-organisms.

These conclusions have, moreover, been confirmed, from an experimental point of view, by some researches made by Nocard to ascertain the antivirulent properties of this phenol. If I add that cresylic acid is much less toxic than carbolic, since per kilogramme of the animal it takes a dose four times as large, you will perceive all the advantages there are in substituting it for phenic acid.

You will find in commerce, under the name of cresyl, an impure mixture, with a strong odor of creasote, of blackish color, which is used in disinfection. This is a solution of cresylic acid in alkaline lyes, for pure cresylic acid is insoluble in water. I pass now to the consideration of chloride of zinc.

Chloride of zinc is an excellent disinfectant; it is, moreover, a deodorizer. This salt in solution goes by two names, being known in England as Burnett's fluid, and in France as the water of Saint Luke. According to Vallin, Burnett's liquid represents 1 part of chloride of zinc to 2 parts of water. The water of Saint Luke contains 77 parts of zinc chloride to 100 of water.

Experiments have been undertaken by Pettenkofer and Mehlhausen to ascertain the antiseptic value of this agent in the disinfection of ships that had conveyed cholera patients. These experiments were quite conclusive, and showed that in two per cent. solution this salt is very energetic. I must remind you that chloride of zinc is a caustic, and that surgery has utilized it for the destruction of tumors. It also serves for the preservation of cadavers, and it is Sucquet who most earnestly commends it for this purpose. He employs a solution of chloride of zinc, marking 40° on the areometer of Baumé. It remains to speak of the sulphates of iron and of copper, and of corrosive sublimate.

Ferrous sulphate is an active deodorizer; it acts even, according to Frankland, on bacteria. Its disinfectant properties are chiefly utilized in destroying the odor of fæcal matters, and its usage is even required by ordinances of the police, ordinances which prescribe 2.5 kilogrammes per cubic metre of fæcal matters, according to Lasgoutte. The experiments of Vallin, and especially those of Boutmy and Descous,† have shown that this quantity is insufficient, and, according to the latter, it takes at least twenty-five grammes for every five litres, which is equivalent to five kilogrammes per cubic metre. I shall return to this subject when I come to speak of the disinfection of fæcal matters.

The sulphate of copper is much superior to the preceding salt from a disinfectant point of view, and great has been my surprise not to see this salt mentioned in the otherwise very complete work of Vallin. Refer to the table given by Miquel, and you will see that while sulphate of iron is moderately antiseptic, and that it takes eleven grammes to sterilize a litre of culture-broth, the sulphate of copper is powerfully antiseptic, and its coefficient of antisepsis is given as .90 c.g.

The experiments of Jalan de Lacroix have also shown the antimicrobic properties of cupric sulphate. Lastly, the researches undertaken by Arloing, Cornevin, and Thomas to ascertain the virulence of the microbe of symptomatic charbon have still further brought to light the great superiority of cupric over ferrous sulphate, and while one per cent. of sulphate of copper destroys the virulence of symptomatic charbon in the fresh state, the same strength of sulphate of iron leaves that virulence unaffected.

Moreover, Charles Richet, in his experiments on the antiseptic action of pure metals upon a culture-broth composed of ninety grammes of sea-water, one hundred grammes of urine, one gramme of peptone, has thus

* Delplanque, "On Cresylic Acid and its Antiseptic Properties" (*Thèse de Paris*, 1888).

† Vallin, "Désinfection et désinfectants," Paris, 1882, p. 775; Boutmy et Descous, "De l'action asphyxiante des eaux vannes des fosses d'aisances" (*Revue d'Hygiène et de Police Sanitaire*, 1881, p. 221).

classed the metals (see the table below), according to the quantity which produces the arrest of development of bacteria and the death of fishes. We see from this table the marked superiority of sulphate of copper.

	Quantity of metal per litre of liquid.	
	Preventing the development of bacteria. Grammes.	Killing the fishes. Grammes.
Mercury	.0055	.00029
Zinc	.026	.0084
Copper	.062	.0033
Iron	.240	.014

Surgeons, moreover, have long made use of the antiseptic properties of the salts of copper in employing such cupric solutions as the Liquor Vilatte, which is a mixture of sulphate of copper, sulphate of zinc, and acetate of lead. But Charpentier, above all others, has shown the great benefits which may be obtained from sulphate of copper as an antiseptic in the septic puerperal affections.

I believe, then, that sulphate of copper ought to occupy a very important place among our antiseptics, and that a two per cent. solution is destined to render us great service. It is true that the price of crystallized sulphate of copper is greater than that of sulphate of iron; but, on the other hand, the lesser quantity required almost offsets the higher cost. I come now to corrosive sublimate.

Here all the experimenters are agreed in admitting that corrosive sublimate is the most active of antiseptics. Refer to the experiments of Jalan de Lacroix, of Warikoff, of Koch, of Staltter, of Rattimoff, and you will see that corrosive sublimate is accorded the very first place. Miquel ranks this mercuric salt among substances eminently antiseptic; at the same time, he regards the biniodide of mercury as superior to the sublimate. You have seen that, according to Richet, mercury occupies by far the first rank among the metals. All these experimenters are unanimous in recognizing that the proportion of 1 per 25,000, or of 1 per 20,000, prevents the development of micro-organisms. This proportion is still less when we have to do with the virulent agents employed for inoculation. Thus, on referring to the experiments of Davaine, you will see that 1 per 150,000 of corrosive sublimate prevents the anthrax virus from being inoculable. The Liquor Van Swieten, which is a 1 per 1000 solution, is, then, always more than sufficient, and this is the solution which is ordinarily used in the practices of disinfection.

You will see, when I come to speak of the modes of disinfection practised in Germany, that it is this solution of 1 per 1000 that is employed in the disinfection of contaminated places, and, to sum up regarding all these liquid disinfectants, I cite the following figures from the report of Chautemps:* "Whenever disinfection to be perfect demands five kilogrammes of carbolic acid, it is rendered quite as complete by means of one kilogramme of sulphate of copper or twenty-five grammes of bichloride of mercury." These figures show you clearly the superiority of corrosive sublimate and that of sulphate of copper over phenic acid, and it only remains for me to speak of the physical agents used in disinfection.

But before proceeding to this subject, I must mention certain recent experiments in Germany, which go to show that the antiseptic properties of sublimate and carbolic solutions are augmented by the addition of an acid. Laplace, for instance, adds to Van Swieten's solution one gramme of hydrochloric acid, and finds a sensible increase in the antiseptic power and diffusibility of the mixture. A mixture of two grammes of carbolic acid in one hundred grammes of water, containing one gramme of hydrochloric or two grammes of tartaric acid, kills in twenty-four hours the spores of bacillus anthracis, while these same spores are found living after thirty days soaking in the same solution without the acid. This is a fact of great importance, which you would do well to bear in mind whenever you have occasion to perform disinfection with carbolized solutions. To get the maximum of disinfectant power from your carbolic acid, you will add to every 100 parts of water 2 parts each of carbolic and tartaric acids. This combination, too, will obviate the necessity of as much alcohol as you would otherwise be obliged to use in making your strong phenic solutions. Alcohol diminishes the antiseptic power of phenic acid, and, in a recent discussion before the Society of Practical Medicine, Weber showed that if human surgery did not derive from phenicated solutions the same advantages as veterinary surgery, it is because in the former alcoholic carbolized solutions are employed, while in the latter only the glycerized solutions are in usage. Koch, in his very positive experiments, has also shown that alcohol diminishes considerably the disinfectant action

* Chautemps, "On the Sanitary Organization of Paris" (*Report to the Municipal Council*).

of phenic acid; it coagulates albumen, and thus hinders the penetrating power of the acid.*

When I spoke of pathogenic microbes I mentioned their resistance to cold, which is such that we have known them to withstand the temperature of —110° C. Cold arrests the development of micro-organisms, but does not destroy them. Applicable to the preservation of articles of food which it enables us to keep indefinitely, cold is proved to be absolutely powerless as an antiseptic. Heat, on the contrary, is one of the most active agencies for the destruction of micro-organisms. This property of heat has been known from remote antiquity. Moses was familiar with it. He orders to destroy by fire all contaminated habitations, and the old saying, "Fire purifies everything," is a popular expression of the antiseptic influence of heat. But to return to the scientific demonstration. I must cite in this connection the work of Henry, of Manchester, who, in 1832, showed that vaccine, subjected to a temperature of 50° or 60° C., loses its virulent properties.† Repeated with more precision by Baxter‡ than by Carsten and Coert,§ these experiments showed that if the temperature of 52° C. applied for thirty minutes does not destroy the virulence of vaccine, that of 64.5° C. certainly suffices. Davaine,‖ in his turn, points out the influence of heat on the destruction of anthracoid virus. But, in proportion as experiments multiply, the conditions of the action of heat become more and more precise. Vallin¶ shows the difference which exists in this respect between dry heat and moist heat. While moist heat will destroy a great number of germs at 100°, it is necessary that the dry heat should exceed 140° C.

After completion of experiments on virulent and septic matters, investigations were made to ascertain the action of heat on the pathogenic micro-organisms, and, without stopping to speak of the experiments of Tripe, of Koch, of Verner, of Miquel, I shall dwell particularly on the more recent experiments of Grancher and Vinet.

In 1885 a commission, chosen from among the members of the Council of Public Hygiene of France, was appointed to study this question of the antiseptic action of heat, and the report made by Grancher and Gariel** concludes in favor of the superiority of disinfection by means of steam under pressure in destroying pathogenic germs, and of the inferiority of apparatuses where heat alone, or steam without pressure, are employed.

The year following, in 1886, the same question was agitated in Lyons by the executive body of the hospitals and asylums of that city, and Vinet,†† in the name of a commission charged with the task of studying the action of heat, formulated some conclusions, which you will permit me to cite, for they sum up all that I have said under this head:

"1. The action of steam under pressure is of absolute efficacy between 112° and 115° C.; it destroys germs the most resistant after fifteen minutes.

"2. Hot air and overheated steam are of less value. Even at 130° C. certain germs escape their influence, even when the application of the heat is prolonged thirty minutes.

"3. The different textile fabrics—linen, hemp, cotton, wool—exposed to elevated temperatures present gradual losses of weight, which are the same under both forms of heat. The loss is, however, slight, and does not amount to more than two per cent., after six consecutive heatings in the hot oven.

"4. The only serious inconvenience is the indelible impregnation of the clothing when it is soiled by coloring matters, as the blood and fæces. This inconvenience always exists whatever be the form of heat employed. It appears as soon as you exceed 100° C.,—*i.e.*, when you approach the degree necessary for the destruction of the resistant forms of the micro-organisms."

Special apparatuses have been constructed to render practicable this application of steam under pressure. I shall return to their descrip-

* Laplace, "Acid Solutions of Corrosive Sublimate as a Means of Disinfection" (*Deutsche Med. Woch.*, October 6, 1887).

† Henry, "Nouvelles expériences sur les propriétés désinfectantes des températures élevées," traduit en *Journal de Pharmacie et des Sciences Accessoires*, 1832, t. xviii.

‡ Baxter, "Report on an Experimental Study of Certain Disinfectants" (*Appendix to the Report of the Medical Office of the Privy Council*, t. vi., 1875, pp. 216, 256).

§ Carsten et S. Coert, "La Vaccination animale dans les Pays-Bas" (*Congrès d'Amsterdam de* 1879, La Haye, 1879).

‖ Davaine, "Recherches relatives à l'action de la chaleur sur les bactéries charbonneuses" (*Académie des Sciences*, 25 Septembre, 1873).

¶ Vallin, "De la désinfection par l'air chaud" (*Annales d'Hygiène et de Médecine Légale*, Septembre, 1877, p. 276).

** Recueils du Comité Consultatif d'Hygiène de France, 1885, p. 98.

†† Vinet, "De la pratique des étuves à désinfection" (*Lyon Médical*, 1886 et 1887).

tion in my next lecture, when I shall take up the means to put in use in order to obtain from steam the best results. What I can assure you, now and henceforth, is that, while the hot-air ovens and those for steam without pressure give only incomplete results, only the apparatuses for steam under pressure, constructed on the models of Genest and Herscher, give results absolutely positive and definite from the point of view of disinfection.

I have finished this long enumeration of disinfectants, and, if I were to sum up, I would say that the one disinfectant above all is moist heat when it attains the temperature of 110° to 115° C., but as this degree of heat is not applicable to all the circumstances where disinfection is demanded, we must also employ the liquid and gaseous disinfectants. At the head of the first we must place corrosive sublimate, which is without an equal, then sulphate of copper. Among the gaseous disinfectants, you must give the first place to sulphurous acid and chlorine.

In the next lecture we will consider disinfection,—that is to say, the practical means for utilizing the disinfectants of which I have just spoken.

NOTES ON A CASE OF MELANCHOLIA AND ON ONE OF PUERPERAL INSANITY.

By H. C. Wood, M.D., Philadelphia, Pa.

IT has been many years since physicians began to study carefully the range of bodily temperature in various diseases, but we have as yet reached in insanity so little positive knowledge on this subject that I have thought it would not be a waste of time to put on record the temperature-sheets of two cases of mental disease of antagonistic types.

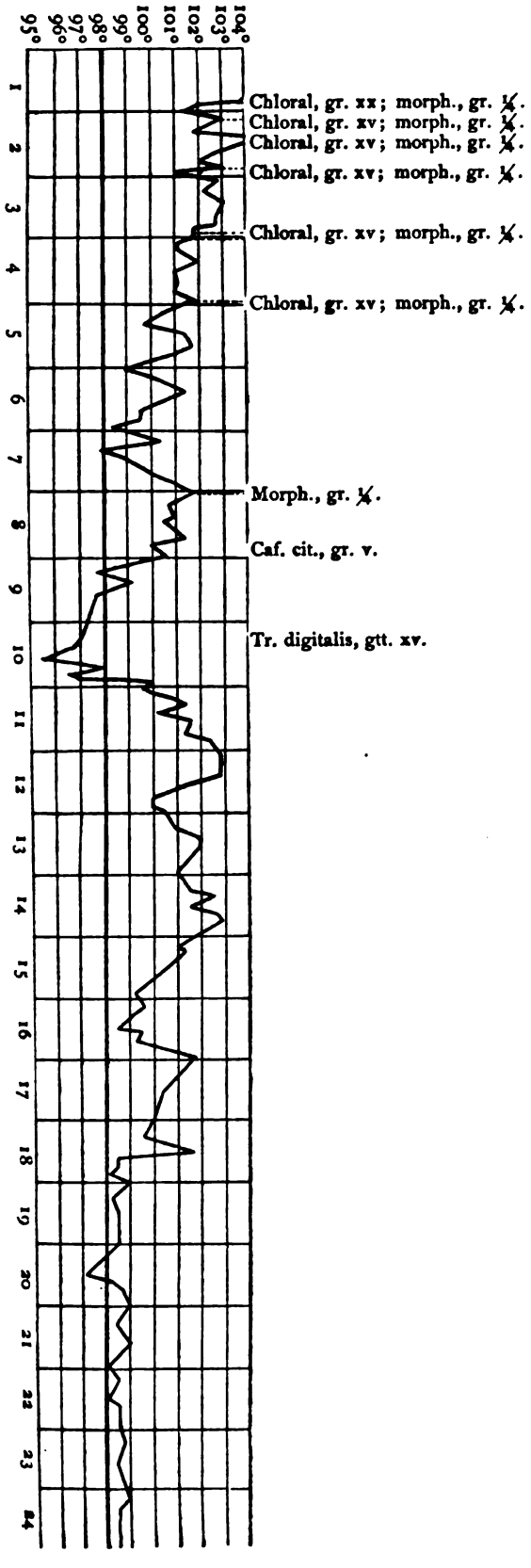
The first of these cases was that of Mrs. R., and represented one of the various forms of mental condition known as melancholia. The subject was a woman of about 60 years of age, who had long suffered from severe chronic rheumatic arthritis, but in whom, while she was under my care, the rheumatic symptoms were entirely in abeyance. She was very thin, with feeble digestion, and every evidence of a low condition of vitality. Her most pronounced mental symptom was depression of spirits and great intellectual feebleness. She had no very pronounced delusions, save only that she believed that the devil was perpetually tempting her to commit suicide, and she was in a condition of continual fear and distress lest she should yield to his suggestions. Although there were evidences of atheromatous degeneration of the vessels, the urine was normal both as to specific gravity, constituents, and quantity. The treatment consisted in the use of all forms of hygienic measures for the building up of the physical strength, with the exhibition of various tonics and nervines. As the patient had at one time been addicted to the excessive use of opium, great caution was exercised in the use of narcotics, but the bromides, camphor, and so-called antispasmodic remedies were freely employed.

The effect of cocaine was thoroughly experimented upon, but, as in all other cases of melancholia in which I have employed this remedy, it failed to do any good. As the result of many months of treatment, the patient was distinctly benefited as regards general health, and also mental symptoms, but was not restored to her normal condition, and my belief is that her mental state is largely the outcome of brain starvation due to atheromatous arteries, and is therefore irremediable.

The points which are shown in the accompanying temperature-chart, and to which I would direct especial attention, are,—first, the fact that for a great part of the time the temperature was below normal. Secondly, that the swing of the temperature was much greater than in the normal individual, and that the diurnal rhythm of temperature seen in ordinary febrile diseases was hardly perceptible. Thirdly, that any exertion produced a marked subnormal temperature. Thus, on the 22d, she took in the morning a walk of a few squares, which was her utmost endurance, and the temperature fell to nearly 96°. On the 23d, a shorter walk produced a corresponding descent of the temperature record. On the 29th, a long walk caused a fall of the temperature below 96°. On the 9th of April she was put to bed, and kept there until the 13th. During these four days of perfect quiet her temperature was steady at 98½°. On the 13th she was allowed to get up and take a walk, and her temperature fell to nearly 97°.

The second case may be considered as an example of puerperal insanity,—*i.e.*, of acute insanity occurring in a puerperal woman.

The outlines of it are as follows: Mrs. S., aged about 30. Before marriage, on two separate occasions, she was excessively fright-


95° 96° 97° 98° 99° 100° 101° 102° 103° 104°
Chloral, gr. xx; morph., gr. ¼.
Chloral, gr. xv; morph., gr. ¼.
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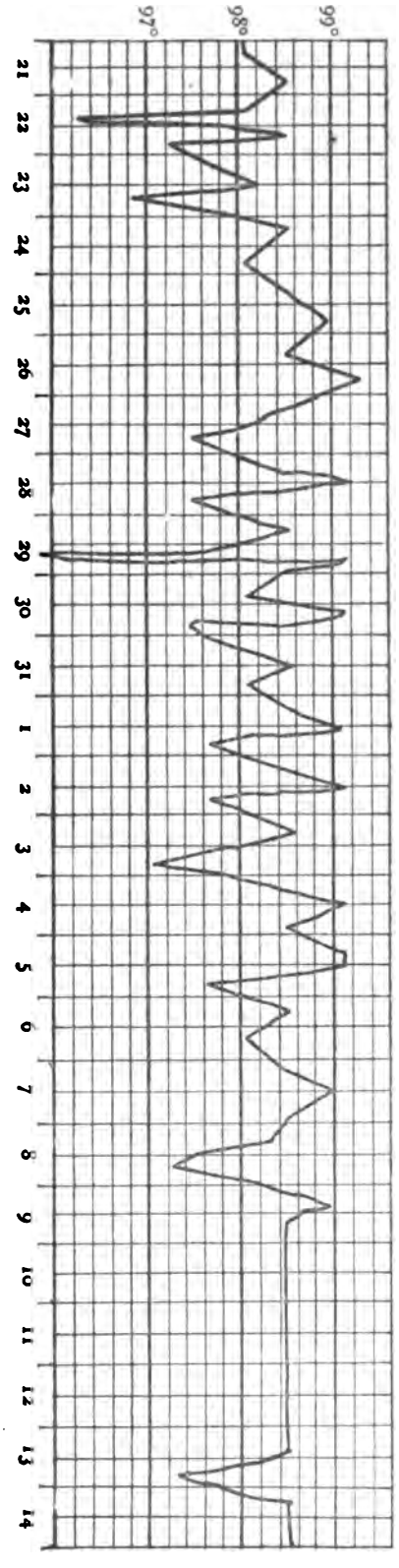
97° 98° 99°

ened by burglars. Each of these frights was followed by protracted insomnia and severe nervous disturbance, apparently of a hysterical character, and her mother states that after one of them her hair rapidly changed to the white color which it now has. She was delivered of her second child January 3, 1888. Although she had seemed feeble during pregnancy, and continued weak after delivery, she nursed the child, and was about the house on January 28. In the morning of January 29 she was noticed to be very depressed and apathetic, and in the afternoon she insisted upon stripping herself naked and going about the house. The next day she was distinctly but not violently maniacal. I saw her on February 1: she was then maniacal, but not violent. During the whole of our interview she talked incessantly and incoherently, did not know at all where she was or who were about her, but insisted that she was at her father's house in a distant city. Her pulse was very feeble, and her appearance distinctly anæmic. During the next two weeks the physical condition of the patient was that of very pronounced weakness, and her mental condition bordered very closely on complete imbecility. Very rarely could she be made to understand that she was in her husband's house, but much of the time, when roused from her habitual state of semistupor or profound apathy, was able to recognize her relatives. Frequently she talked nonsense for hours together, and she almost always answered simple questions incoherently and without reference to their meaning.

At night there was active mania with insomnia, unless she was quieted by narcotics. She did not appear to have distinct delusions, but was at times markedly hysterical. At no time was there uterine disturbance or any evidence of septicæmia or of any local disease. By the 21st of February her bodily condition had greatly improved, as well as her mental state. She at that time knew her surroundings, and appreciated well her position and circumstances; but when talked to for a while gave evidence of mental weakness. From this time my visits ceased, but I am informed that the patient slowly convalesced, and by the latter part of April was considered to have recovered her bodily health and mental condition. She has remained well up to present writing, except that she occasionally has some depression of spirits.

The record of the bodily heat, which is appended, shows remarkable irregularity of the temperature, with complete absence of anything like diurnal rhythm, and also reveals the fact that when her temperature was high the exhibition of a dose of chloral and morphine was invariably followed by an immediate fall. Tincture of digitalis had no perceptible effect upon the temperature. On the 9th of January her temperature fell distinctly below normal, and continued this descent until about noon of the 10th, by which time the patient was in a condition of alarming collapse, from which she was rescued by very energetic treatment with stimulants, external warmth, etc.

The case of Mrs. S. is of interest in its bearings upon a very important practical problem as yet unsettled by alienists,—that is, the relations between acute mania and the very fatal disease variously known as mania gravis, Bell's disease, acute periencephalitis, etc., a disease in which an early death or permanent intellectual ruin marks the grave lesion of the cerebral cortex. The symptoms in these two affections certainly are very similar, except it be in point of degree and in final issue.

I believe that in nature cases of every degree exist, between the mildest attack of acute mania, in which the symptoms must be considered to be the result of functional derangements and pass off completely, up to the severe organic disease, in which death takes place in the course of a few days. It is, of course, important to know whether in this apparent unbroken series of cases it is possible to draw a line which shall separate cases which will end in recovery without damage to the cerebrum from cases in which the brain must undergo organic changes. We are in the habit of talking about functional and organic diseases; but functional excitement of the cerebral cortex must be accompanied by, if it be not dependent upon, congestion, as well also by nutritive disturbances of the nervous protoplasm. This congestion and this nutritive disturbance may well in certain cases be arrested before they have gone so far that their results can be noted by the microscope, while in other cases they may continue and increase until they give rise to gross lesions of the cerebral cortex: may not in such a way a so-called functional disease deepen into an organic affection? I do not know myself of any symptoms by means of which we can separate the severe functional cases from the mild organic ones, unless, indeed, the existence or non-existence of fever be such a

criterion. Hammond affirms that in acute mania there is never fever. It is well known that in the graver disease the temperature is always very much disturbed with stormy paroxysms of rise or fall, and usually at intervals reaches a great elevation. I am not myself assured of the correctness of the dictum of Hammond, and think that the alienist should carefully study the temperature in cases of acute mania. In Mrs. S. the irregularities of temperature were very pronounced, and the thermometric readings were high, so that in this feature the case conformed rather to the type of acute periencephalitis than to that of acute mania; but, in the course of a few weeks, there was great amelioration of the mental symptoms, followed in a short time by a complete mental recovery. During the progress of the case the suggestion was made that possibly septic poisoning, or inflammation of some organ apart from the brain, might be the cause of the rise of temperature; but repeated and careful search failed to detect anything that would warrant this supposition.

THE ARKANSAS LITHIA SPRING.

By George Adams, M.D., Poplar Bluff, Mo.

A RECENT review of the papers contributed to the "Original Communication" department of the Therapeutic Gazette on "The Therapeutic Effects of certain Mineral Waters," and especially those of Dr. Anderson, of Virginia, and Dr. Millard, of New York, on "The Red Sulphur Springs of Virginia," suggests this contribution to hydrologic literature. For the last few years I have observed with quiet satisfaction the gradually increasing interest of the American practitioners in medical hydrology, and feel assured that in the near future they will award this treatment the position it merits, or at least that attention given it by the European profession. While those authorized to classify and report on the mineral waters of the United States are making commendable progress, not more than one-tenth of our mineral springs have been analyzed.

There is a spring in the southwest portion of Arkansas, not far from the Texas State line, five or six miles from Hope Station, Hampstead County, called the Arkansas Lithia, that bears a striking resemblance to the Red Sulphur of Virginia, but is even more remarkable, as may be seen from the following analysis, which was made by a Virginia professor of chemistry. Each imperial gallon contains of—

Sodium chloride	24.164
Lithium chloride	3.638
Potassium chloride	.415
Magnesium chloride	4.366
Calcium sulphate	14.572
Magnesium sulphate	11.977
Strontium sulphate	1.767
Magnesium borate	.095
Ammonium nitrate	1.184
Iron oxide	4.554
Alumina	1.017
Silica	4.053
Organic and volatile	4.064

This is unquestionably a remarkable and curious combination, when we consider the large proportion of several ingredients, and especially its fertility in lithium,—no other water in this country affording so much, according to the tables given in the latest edition of the United States Dispensatory, which I have before me.

The most curious feature of this Arkansas lithia water is its color, which is a dark amber, resembling old rye-whiskey or apple-brandy. The spring is out in a high, rolling, piny hill-country, several miles from any swamps and ten from the Red River bottoms. It breaks out of the side of a high hill, the soil of which is sandy, the subsoil red clay. Supposing the color might arise from something like rotten wood or other decaying organic matter, I examined the land adjacent very carefully, but found nothing of the sort. I then had all the water dipped out (the excavation being six feet deep by two feet in diameter, and lined with a brick wall), and discovered that the chief vein issued from a strata or ledge of dark-red sandstone or iron ore five feet seven inches below the surface of the ground. Around the premises I found numerous specimens of petrified wood, and on the hill above quite a deposit of iron ore from surface indications. As to the quality of the latter my knowledge of mineralogy does not entitle me to decide. The area around the spring of maybe fifty acres had been cleared of timber, cultivated, and turned out as an old field. The spring itself was enclosed with a substantial fence, to prevent the depredations of cattle. This was rendered necessary from the fact that they would come in numbers, even from a distance, to drink the water in the spring of the year. As I sat by the reservoir, dipping up and drinking this

extraordinary fluid, I was puzzled and perplexed,—

> "For I could not help agreeing
> That no living human being
> Ever yet was blessed with seeing"

such a natural imitation of veritable cognac. The resemblance terminated with the color; the taste did not bear the slightest relation. It was unpalatable at first, but grew on me, so to speak, and after repeated draughts I liked it. The odor was sulphurous. In less than a half-hour I was prepared to give ample testimony as to its diuretic properties, and with equal propriety to its aperient effects a few hours later. I have since made a very careful examination of the analysis, item by item, and combined the same ingredients, dissolved in distilled water, as near the same proportion as was practicable outside a well-appointed chemical laboratory, to produce if possible the rich, dark color, but was not successful. I am convinced, since reading Dr. Millard's learned paper, that this, like the Virginia Red Sulphur, may be classified with the French sulphuretted-calcic springs,—differing, however, in one particular, the Arkansas spring possessing the chloride of lithium. This, I apprehend, adds to its efficiency in renal disorders. A very sprightly physician in Arkansas, expressing his appreciation of and confidence in it, said he had used it in aggravated cases of kidney-disease successfully, after all other remedies failed to relieve,—saying, with Western emphasis, "If anything will cure Bright's disease, it is that water!"

Several hundred gallons have been shipped to Kansas, Missouri, and Kentucky, to parties who wished to try it themselves and to physicians for experiment. It was charged with carbonic-acid gas and kept in soda fountains in several towns, and in almost every instance where it was used it was declared as having produced satisfactory results. I have in my possession a score of testimonials from reliable physicians and druggists, and, while I take such things *cum grano salis*, my faith in the water is confirmed by their unanimity of favor.

CASE I.—A case in Ford County, Kansas; patient, æt. 55, had suffered eighteen months; diabetic; general lassitude; gradual loss of flesh and appetite; swelled feet and legs, that pitted on pressure. Towards the last micturated frequently, voiding small quantity of urine each time. Had no faith in the water, but tried it because nothing else did any good. Relieved in seven weeks by drinking the water freely.

CASE II.—A case from Batesville, Ark.; merchant, who had led a sedentary life, æt. 30; suffered excruciatingly from passing calculi through the ureters; very much reduced and weakened. Relieved in a few weeks by free use of the water. No return of the trouble so far.

CASE III.—Miss ——, Johnson County, Kansas; a young lady, of 19; anæmic; languid; suffered with pain in the back constantly; slept badly; poor appetite; profuse discharge of a white, gelatinous fluid, sometimes very offensive. Relieved by drinking the water and irrigating the vagina with it three times a day. The water was slightly heated after finding that injecting it at its normal temperature produced cramp.

CASE IV.—A case of chronic gonorrhœa; man, of about 23; worked in livery-stable in Dodge City, Kan.; used the water as a last resort, injecting after passing urine and drinking the water regularly. Relieved in nine or ten days. The discharge returned after a few weeks, and was checked in the same way.

CASE V.—An old lady, with vaginitis. Digital examination showed excrescent surface. Relieved by drinking the water and injecting with it. This case was stubborn, but finally cured.

And so I could multiply cases, but I dare not trespass upon your valuable space. I think all these cures are due to the fact that the water tones up the stomach, relaxes the bowels, excites secretions from the kidneys, and has a decided depurative influence in eliminating deleterious matter. It has, moreover, a soothing, soporific effect, and when I drank it, as I usually did before retiring, I slept like a top. It does not bear transportation in wooden vessels, which give it a woody taste, but it keeps well in glass, preserving even for a year its color, taste, and effects.

This remarkable and, I must think, invaluable spring is as yet unknown. There are no accommodations other than one or two rude board cabins. The owners of the property are poor, and do not know how to improve it; and yet how many a pang the weary invalid would be saved, who dreads a tedious sea-voyage to the sulphuretted-calcic springs of Europe, if a suitable sanitarium were established here in the Southwest! The climate cannot be excelled; the country, in contour and latitude, is just like Middle Georgia, now so desirable as winter resorts. Only a few weeks after the chrysanthemum succumbs to

the ruthless frosts, the jasmine-blooms freight every gale with its richest perfume; and even while the Northwest is hard-locked in icy fetters, there the mocking-bird is carolling notes.

I discovered that Arkansas, associated with the hunter's roofless cabin and coon-skin cap, possesses rare, vast, and varied resources. Her coal, iron, antimony, manganese, lead, copper, and zinc are incalculable as to value. Her gypsum-beds seem inexhaustible. Her mineralized waters percolate through the soil and rocks of every county, some of which have already acquired a world-wide celebrity. The Eureka in the northwest, the Hot, the Mountain Valley, and the Potash Springs in the centre, and the Lithia Spring in the piny hills of the southwest, will in the future become a vast sanitarium for earth's suffering thousands.

Hope, the town nearest the Arkansas Lithia Spring, is a town of fifteen hundred inhabitants, and a place of some commercial importance. Its people are refined and hospitable. The disciples of Æsculapius are numerous, among whom I found several very pleasant gentlemen. The average Arkansas doctor is, to say the least, valiant in the use of remedies.

But enough. I have written this article not only to give the information it contains, but to encourage the development and elicit discussion of hydrology in the United States.

SEA-SICKNESS AND ITS RELIEF.

By John J. Sellwood, M.D., East Portland, Oregon.

HAVING had some experience with sea-sickness, while acting in the capacity of ship's surgeon, I venture to send a few remarks on sea-sickness and its relief. That sea-sickness is a neurosis none can doubt. The phenomena peculiar to the disease are caused by the sudden shock to the nervous system, its condition being changed from one of tranquillity and ease of function to one of general disturbance. This sudden shock causes a retardation in the emission of nerve-force demanded of the nervous system, and this, together with the sudden misplacement and return of the viscera, especially the stomach, aid in producing the distressing symptoms so well known to those who have travelled at sea. Through reflex action the heart's function is impaired, causing deficient circulation in the extremities and surface of the body; thus we have the coldness of these parts so constantly and bitterly complained of by sea-sick people. The cerebral anæmia caused by the deficient circulation produces the giddiness common to the disease. The stomach also through reflex action becomes deranged, the digestive process being more or less retarded, and hence its repugnance to food. The gastric juice is secreted in great abundance, and this acid secretion acts as a direct irritant to the stomach, and thus prolongs the sickness. The effect on the vision, and the feeling of general insecurity, also help to increase the trouble. Constipation is a never-failing complication of the disease. This, I think, is caused by the regurgitation of the biliary and intestinal juices into the stomach, and from there being thrown off. Thus "nature's purgative" is wanting, and constipation ensues. The mental symptoms are often very striking. The sufferer feels his whole existence, mental and bodily, overwhelmed by gloom, anxiety, and foreboding. May this not be caused by the cerebral anæmia having caused derangement in the brain function?

In most cases, if left alone for from three to five days, the nervous system, by force of *habit*, accustoms itself to the new state of affairs, reflex disturbances are consequently lessened, and finally cease, and convalescence is established.

The remedies for sea-sickness are as numerous as those for vomiting in pregnancy; but, after experimenting with twenty mild and severe cases, I venture to recommend the *hydrochlorate of cocaine*, properly administered, as a remedy of great value. Not that I wish to say that it will cure *all* cases, but that it will cure a good percentage of cases, and *relieve* nearly all of them. In severe cases, where symptoms of collapse are presenting, ¼ of a grain of cocaine should be given by the stomach every hour until the emesis is relieved. Then the dose should be decreased by one-half for twelve hours afterwards, and gradually decreased from that on, until the patient is able to take and retain nourishment. Cocaine is easily retained by the stomach when rubbed up with a little flour and placed on the tongue. I have never known it to fail to give relief, and have seen many cases cured by its use. If taken in ⅛-grain doses three times a day for one week before going to sea, I believe it would be equally beneficial as a preventive.

1327 Sixth Street.

NOTES ON ANHALONIUM LEWINII, EMBELIA RIBES, AND COCILLAÑA.

By S. F. Landry, M.D., Logansport, Ind.

THE commencing or continued doses of the extract anhalonium ought not to be more than a single drop. Mingled with sweetened water in fractional drop doses would be still better. In severe angina pectoris, pneumothorax, or asthmatic dyspnœa, perhaps 2- or 3-drop doses might be advantageously used occasionally until relief is experienced, and then smaller instead of increasing doses. Its first action is that of a depressant, pulsations weaker, slower, often below 40 per minute, coolness of the surface, slower respiration, and slight feebleness. In a case in which I administered four drops this was followed in the second stage of its action by a gradually increasing warmth, full, tense, 60 per minute pulse, and regular, deep, full, natural breathing, increased capillary circulation, till the ends of the fingers were of a sensibly darker red color to the second joint; hands and feet warmer. Then followed an easy, comfortable, deep breathing, and perfect freedom of oppression about the præcordia; drowsiness and natural sleep followed; slight subsultus, quickening and weaker pulsations, lowering of blood-force, and slight frontal headache, but succeeded by decided improvement in strength and respiration.

Thinking that it would make a good substitute for nux or ignatia as a respiratory stimulant, I have employed the following mixture of fluid extracts:

℞ Anhalonium, gtt. i;
Digitalis, gtt. i;
Belladonna, gtt. i;
Cannabis indica, gtt. ii;
Water, ℥ss.

This was administered to a phthisical patient at bedtime. After the incipient elevation of temperature the breathing became easy, free, and deep. Next morning the patient was better than for months previous thereto. It excels quebracho as a sustainer of respiration, and is a far better cardiac stimulant than the *C. Bonplandi, grandiflora*, etc. Uncombined and alone I believe it to be the best concentrated cardiac tonic we possess. One point must, however, not be overlooked. I have often seen it produce seminal emissions *without erection*. Hence its long-continued use in such cases, or its use in large doses, must be avoided. In highly-wrought, nervous individuals it should be sparingly used, or given only in fractional doses. In sluggish, lymphatic, and sanguine temperaments it may be used more freely. It seems to me to possess strychnine activity, morphine sedative, and quinine tonic power. As an adjuvant to digitalis it is invaluable.

In a case of protracted indigestion, accompanied by flatulence, whenever sugar or starch was eaten, embelia ribes acted favorably. The flatulence ceased; the symptoms of debility decreased. It thus served as an antacid, stomachic tonic, and nervine. Digestion improved after the first dose. Only one fault could be found,—it held back the peristaltic action of the bowels; it is the opposite of strychnine, etc.; in this particular it is a *muscular sedative*, and must be followed after a few doses with a good seidlitz powder or 10 drops of cocillaña.

In a case of obstinate constipation of *"three days without a motion" of the bowels*, a dose of 10 drops of cocillaña was administered at bedtime in a wineglass of water. Slight nausea followed, but of only a few minutes in duration. The patient slept well. In the afternoon of next day, on feeling the pressure, went out; thought he ought to take an enema first; expected a hard, cutting stool, as he had hemorrhoids, but what was his surprise to find a soft, easy movement. Next day and forward so far bowels regular and easy.

A CASE OF HEART-DISEASE.

By V. M. Reichard, M.D., Fairplay, Md.

THE following case, I think, offers some points for careful thought, and it has certainly thus far proved a most instructive one to me:

Mrs. S., æt. 55, came under my care in October, 1887. She was at that time suffering from failing heart, which failure seemed the result of dilatation, due to general failure of the vital powers. Had always been a woman of almost masculine habit. When in good health weighed nearly two hundred pounds. In the spring of same year began to fail in health. Went on from bad to worse. In August, 1887, went out-doors for the last time.

Status Presens.—Rather slender woman; has the appearance of considerable emaciation; color bad: very sallow; evidently suffering great dyspnœa; is entirely unable to

talk or to take a thermometer under her tongue; all her attention occupied in her efforts to breathe; family state that she has not lain down in bed for some time; some œdema of feet and legs; slight ascites; chest dull above the nipple-line on both sides; naturally higher on right side. All breath-sounds supplanted by râles of all kinds almost. So much noise was there in the lung that the heart-sounds could not at that time be made out. Later, however, there was found to be a mitral regurgitant murmur. As there was absolutely no history of preceding disease, I ascribed this murmur to the natural incompetence of the valves which would follow dilatation.

She was put on the best routine treatment which I could devise. Blisters to the chest would relieve when all else would fail. Apropos of this, I should like to ask why blisters have gone so almost entirely out of the treatment laid down in the books for dyspnœic as well as other conditions? Although Mrs. S. complained most bitterly of them, yet, when everything else was exhausted, she would ask to have one applied. Through the winter we rang the changes on all the so-called heart tonics. Infusion of digitalis would relieve her, but could not be used for the terrible nausea and vomiting it induced. Pure caffeine, in combination with sodii salicyl., gave the best results. But, in about two weeks, this, too, would have to be abandoned because of the nausea. Although her feeling of well-being was very much improved, yet her dropsy increased, and she could not lie down. When spring came, as she was steadily growing worse, and all treatment seemed of no avail, I tried Professor Bartholow's plan (*Med. News*, April 27, 1887) with nitro-glycerin, Fowler's solution, good food, and gradually-increasing exercise.

She insisted that her improvement began almost at once, and was continued until the œdema was entirely relieved and she could lie down in bed. At this time 9 drops of the one per cent. solution of nitro-glycerin were required to induce the physiological effect. Unfortunately, she was careless about herself, and I did not see her for several months, her medicine became exhausted, and she failed to procure more. So, when I saw her, the condition was worse than when she began to take the drug. She had ceased to take it, perhaps, a month.

Encouraged by previous success, we put her again on the nitro-glycerin, beginning with 3-drop doses, and going on up until she was taking from 30 to 40 drops every four hours. This dose did not produce the sensation of fulness of the head and the flushing of the face, but induced a decided feeling of well-being. How to account for her ability to take such doses I cannot tell. The preparation was from a reliable chemist, and 4 drops was the limit to which I could push some other cases, who were taking it out of the same bottle. As a control, I procured Wyeth's tabloids, and she took of them without effect until she reached the dose of 12, when she refused to go higher, on account of the trouble of swallowing. What effect a dynamite bomb would have on her I am unable to say.

While taking the nitro-glycerin the second time, although her feeling of well-being was fair most of the time, her dropsy became terrible. She was swollen all over. Her legs broke open, and the water ran down and formed pools on the floor. She was raw on the posterior aspect of the leg from the bend of the knee to the heel. The stench from the necrosing tissue was awful. Her abdomen filled up to such an extent that she could not breathe. There seemed to be nothing for her but speedy dissolution. As a final measure I tapped her abdomen, using an ordinary-sized aspirator-needle. Drew off about two quarts of fluid. She felt better at once. The hole in the skin made by the needle remained patulous, and for ten days a very large quantity of water was discharged therefrom. She has never been so bad since as before the tapping. She, herself, says that was the beginning of her improvement. As she was becoming very anæmic, and her kidneys were not acting, put her on Basham's mixture, with some improvement. About a month later again tried her with the infusion of digitalis, and the result was all that could have been hoped for, and more than any of us had any reason to expect. She took a tablespoonful of the infusion with ten grains potass. bitart. early in the morning, two drops of Fowler's solution before meals, and the diuretic iron mixture after meals, with frequent small drinks of *gin*. The result of this was simply marvellous. *All her dropsy disappeared*, her legs healed, and she could wear with as much comfort as before the same shoes she wore before she got sick, and there only remained the blackened epidermis to tell where the terrible ulcers had been. Unfortunately, without consulting me, she stopped all her medicine, and started off on a visit to relatives, involving a drive in a carriage of 1

mile and a railroad journey of six miles. When she arrived with her friends they injudiciously gave her an upper room for a bedroom, and the going up steps, added to the strain she already had, was too much for her heart, and she broke down, and I fear for the result. A heart that has failed several times and rallied is much more difficult to manage than one which is in its first breakdown.

I think Mrs. S.'s recovery is directly due to the long course of nitro-glycerin and Fowler's solution. In this time her dilated heart-walls were built up, thickened, and strengthened, and when she was put back upon the digitalis the latter had a stout, thickened heart-wall upon which to act, instead of the attenuated one which previously existed. This, at least, is my explanation of the success of the treatment which has been given above.

NOTE ON NASAL BOUGIES.

By H. C. Wood, M.D., Philadelphia, Pa.

HAVING been so unfortunate as to have a severe case of hay-fever in my own household, I have been led to make experiments upon nasal bougies, and think that the results are worthy of a brief note as to the best material for the bougies and the best method of using them. Gelatin has been tried in a number of forms and combinations, but without success. The bougies made of it when fresh have not sufficient stiffness to be inserted into a partly occluded passage, although in a few days they become so hard and horny that they are distinctly irritating. On the other hand, as a basis, cocoa-butter seems to be free from objection. Although a little skill is required in preparing the bougies when cocoa-butter is used alone, yet the employment of wax is altogether objectionable. The cocoa-butter I find to be entirely free from irritating properties, and to melt rapidly in the nostril.

In my own hands the bougies at first entirely failed to give relief, because, when inserted, they fell back into the nasal passages going towards the mouth. If, however, the patient be lying down, and the bougie be pushed forcibly upward, so as to jam itself between the two sides of the upper nostrils, closed by the swelling of the erectile tissue, it will be held firmly in place, and in a couple of minutes melts. After the insertion of the bougie, the patient should still continue to lie down, with a pledget of absorbent cotton that has been wet with cocaine pushed up the nostril, so as to prevent the melting cocoa-butter from running over the lip. The only medicine which I have found of service in hay-fever is cocaine, which, however, seems to act better when added to a little atropine. Each bougie may be made to contain one grain of the hydrochlorate of cocaine and one-twentieth grain of atropine.

A CASE OF DUODENAL ULCER.

By Dr. Chas. E. Woodward, West Chester, Pa.

MRS. M., aged 52, weight one hundred and fifty-two pounds, habits active, florid complexion, and nervous temperament, good general health, and fairly good family history. Mother living, aged 85, and in good health. Father died at fifty, with jaundice. Six brothers and sisters, all in good health, except one brother, who has been insane for a few months.

June 30, 1887, was taken during the night with cholera morbus, pain, vomiting, diarrhœa, and severe exhaustion. She recovered in two or three days, but noticed her digestion was not as good as it had been before the attack, as shown by some taste in mouth after eating, acid eructations, constipation, and sometimes nausea. She did not apply for treatment, however, until January 7, 1888, when she was taken with violent pain in both shoulders, present all the time, but exaggerated by movement. Temperature, 103⅗°; pulse, 130; bowels constipated; urine highly colored and scanty; no swelling noticeable in joints. After several days treatment she recovered, except a stiffness in both shoulder-joints, which was treated with electricity for some time, and finally got entirely well.

July 28, 1888, noticed she was losing flesh and strength; her present weight was but 128.15 pounds; that she felt tired, and had no appetite; did not sleep well; she suffered no pain; had nausea; no vomiting; was passing a very small quantity of urine, which, measured, was found to be one pint in twenty-four hours; reaction acid; specific gravity, 1030; no albumen, but contained an excess of urates and phosphates; temperature normal; tongue red and coated in middle; bowels regular. After a few days' treatment quantity of urine increased to two pints in twenty-four hours; was eating and sleeping better.

August 30, 1888, was called to her during the night. Found her with a temperature of 102⅘°, pulse 140, and full; tongue red and dry; abdomen tympanitic, painful, and very tender over the left side; diarrhœa and sick stomach.

August 31 discharges contained blood, and it became necessary to use enemata of starch-water and laudanum to relieve the tenesmus.

September 4 bowels moved only once, and passages contained no blood; temperature normal; pulse, 120; no pain or tenderness over the abdomen.

September 9 she was wakened by a lancinating pain over heart; it was momentary but severe. Several such stitches occurred during this morning, and afterwards she would at times feel pain in heart, for which she wore a belladonna plaster with benefit.

September 11 she complained of difficulty in breathing, and asked to have her head raised. This occurred two or three times afterwards. She had no lung trouble. Second sound of heart was feeble, and at times a murmur could be detected over apex; pulse was at times irregular. After this her symptoms changed little from day to day. She would crave food, but would only take two or three spoonfuls. She suffered from nausea and sour taste in mouth almost every day, and would often vomit mucus and bile, but never food. She spit a great quantity of yellow, bitter matter, which stuck to her throat and always preceded the vomiting. The vomiting was at irregular intervals, and had no relation whatever to what or when she ate food. She was always thirsty, and took large quantities of ice. The pulse was as high as 140 and as low as 98, but generally remained at 120, generally regular, but at times was irregular and quick. Tongue was red and often dry. She was nervous, and did not sleep well. Morphine always increased nausea. She did not complain of any pain during her sickness, except in the acute attacks mentioned above. There was no elevation of temperature except at these times. Food never gave her pain nor discomfort.

There was no tenderness over abdomen elicited by pressure. Sometimes when palpating over abdomen she would say, "It hurts there;" but the same pressure applied to the same part immediately after she would say caused no pain. Her bowels were inclined to constipation; frequently purgatives or injections became necessary. She had a loathing of food, although she complained of hunger. She was nourished with enemata of warm milk, of which the rectum would retain only about three ounces at a time. We tried several different kinds of foods, also nourishing her by enemata alone, giving nothing by the mouth, but could see no difference in her symptoms or comfort, whether she took liquid food, solid food, or no food at all, nor did any medication have the least effect. She gradually grew thinner and weaker until November 16, when she died.

November 17, twenty-seven hours after death, post-mortem examination was made by Dr. Dunn and myself, in the presence of Drs. Price, Massey, and Hoskins. On opening the abdomen we found no effusion; all organs were abnormally pale; small intestines contained a quantity of fæces. On removing the duodenum we found slight adhesions to under surface of liver, which I dissected off with my fingers carefully, and found it covered a duodenal ulcer, about one centimetre in diameter, with ragged edges, perforating all the coats of the duodenum, and situated posteriorly two or three centimetres from pylorus. The gall-bladder and ducts were filled with calculi, weighing two to three decigrammes each. In the pancreatic duct were wedged two or three calculi, no doubt obstructing its function. The pancreas, liver, spleen, kidneys, and stomach showed no signs of disease other than anæmia. We were not permitted to open the thorax.

THE USE OF ANTIPYRIN IN OBSTETRICS.

From a paper published in the *Bulletin Général de Thérapeutique*, October 15, 1888, by Drs. Auvard and Lefebvre, the following conclusions are drawn:

First.—In certain impressionable women the administration of antipyrin during labor appears to produce considerable reduction in suffering; but this is nearly always very transient, and it is doubtful whether it is the action of the drug or the suggestion resulting from the hypodermic injection.

Second.—In the majority of cases the action of antipyrin is entirely negative.

Third.—Without denying the good results which may be exceptionally produced through the use of this remedy, its action in reducing the pains of labor in this case should be regarded as thoroughly inconstant, and by no means to be compared with chloroform or chloral in obstetrical doses.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

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Leading Articles.

MEDICAL ADVERTISING AND PATENT MEDICINES IN THEIR RELATIONS TO THE CODE AND TO THE PROFESSION.

THE code of ethics of the American Medical Association nominally receives from a large proportion of the medical profession some measure of that respect which is properly due to it, but under the pressure of competition and the growing belief in the practical efficacy of advertisement, the real influence of the code upon the daily life of the doctor is being slowly lost. It is, indeed, hard to say where the line between proper and improper advertisement should be drawn.

One doctor writes a book upon some medical subject for the purpose of getting practice, and not as the outcome of superior knowledge which he has gained in practice, then he has the book reviewed in lay and medical journals alike, or perchance persistently advertises himself as its author. Another gets his extra copies from the medical journal by the thousands, and sends them to every part of the country, not only to his professional brethren but also to the laity. Another writes articles on popular medical subjects for magazines, or prepares small popular books, and, if he be gifted with a fertile imagination, a shrewd thought, and a facile pen, gains wide popularity and renown, and reaps his harvest of shekels.

A medical college or a medical institution, such as a hospital or dispensary, advertises itself and advertises its staff without exciting comment; a young man, seeing this, starts a dispensary, and sends its annual report, of which he is the central figure, broadcast, or, as we have known, to every postmaster in the United States; still another candidate for practical success builds a sanitarium, and announces his investment in true advertising style, lauding its peculiar adaptation to the healing of the sick, at the same time flaunting his own name in large letters.

In Boston the medical specialist boldly announces in the medical journals that he is paying especial attention to the treatment of a certain class of diseases, and apparently none of his brethren find fault. Were the specialist in Philadelphia to do such a thing he would be tabooed; on the other hand, we find in Philadelphia that such institutions as private hospitals for the insane are widely advertised, at least in the medical journals.

What, however, is the vital difference between Dr. Jones, who announces that he has especially educated himself for the treatment of the insane, and Dr. Thompson, who announces that he has built a sanitarium, and has especially prepared himself to treat the insane in that sanitarium?

Justice demands that all members of the profession shall be treated alike by the profession, and that all shall be forbidden advertisement or all shall be allowed to advertise. Medical public opinion seems to warrant the advertisement of sanitariums and private insane hospitals in medical journals. This being so, it is both inconsistent and irrational to deny the right of a physician to put his card in a medical journal. We suppose that almost every one—even in Boston and the Far West, two extreme localities, where the practice of medical advertising seems loosest—would acknowledge that the line should be drawn at medical journals, and that no medical institution maintained for the purpose of pecuniary gain should be allowed to advertise itself in lay journals; and yet a prominent member of the American Neurological Society advertises his Washington sanitarium in a lay journal, and apparently no one says "nay."

Happy *was* the man who had the skill to advertise himself widely among the people without offending the taste of his medical brethren; happy *is* the man who builds his house upon the hill, where it cannot be hid, and fills the earth with the praises of his trap to catch sunbeams.

Another ethical question which has recently been forcibly brought to our notice is connected with that provision of the code, which says, "It is derogatory to professional character for a physician to hold a patent for any surgical instrument or medicine, or to prescribe a secret nostrum, whether it be the composition or exclusive property of himself or of others. For if such nostrum be of real efficacy, any concealment regarding it is inconsistent with beneficence and professional liberty; and, if mystery alone gives it value and importance, such craft implies either disgraceful ignorance or fraudulent avarice. It is also reprehensible for physicians to give certificates attesting the efficacy of patent or secret medicines, or in any way to promote the use of them."

It is an evident fact that this provision of the code is absolutely disregarded by almost every physician in the United States; antifebrin, antipyrin, sulphonal, and other medicines are to-day enormously used, although they are patented, or, which amounts to the same thing, their manufacture and sale is monopolized by making the name a trade-mark. Thus, we believe that the word antipyrin is a trade-mark, and that it is supposed to be the law of the United States that whenever antipyrin is ordered, the substance made by the manufacturing firm owning the trade-mark must be furnished. The present condition of the law upon this subject, however, seems to be not thoroughly settled, and to Parke, Davis & Co. both the professions of pharmacy and medicine owe a debt of gratitude, because they have had the nerve and the willingness to spend money, in order to determine, if possible, the exact legal status of the question. It seems that the claim has been made that when any physician orders acid phosphate, Horsford's Acid Phosphate, which has been a trade-marked article, must be supplied. An action was taken by the Rumford Chemical Works Company, the proprietors of Horsford's Acid Phosphate, against George L. Muth, druggist of Baltimore, because he was selling, under the name of acid phosphate, a preparation issued under the label of Parke, Davis & Co. The question at issue was really the legality of proprietary interest in medicinal formulæ, and the attempt of complainants—the Rumford Chemical Works Company—to establish such right in acid phosphate was disposed of by a dismissal of their complaint. The case has been appealed to a higher court, but is not thought probable that the decision of the lower court will be reversed. If this decision stands, it would appear that the name of a drug cannot be legally trade-marked so as to protect a monopoly of such drug. Nevertheless, the common belief in the legality of such protection, and the power of capital in the presence of any uncertainty of the law, makes it easy to obtain by intimidation a monopoly. The retail druggist is usually a very small capitalist, has little or nothing at stake in an individual remedy, and naturally is afraid of a legal contest.

We are not ourselves entirely sure of the correctness of the position at present taken by the code. The value of the patent law in the United States to the community grows out of the fact that such protective laws enormously stimulate inventions; if there were no patent law, and if there were no protection to the article patented, the mechanical growth of the last half-century in the United States would, we believe, never have occurred. In America, the average man requires a tangible practical reward for his labor; only a few mentally diseased persons, who have been infected from birth with a passion for science and scientific research, will work for no tangible reward. It may be very well argued that the profession is wrong in taking the position that the discoverer of the new medicine shall receive no reward for his work, and that there shall be no pecuniary stimulant to discovery, but it cannot be denied that the profession is to-day absolutely wrong in publicly taking the ground that patent medicines are not to be employed, while they privately use them every minute of the day and every hour of the night.

It is very clear that any law which should allow a medicine to be patented should require that the originality of such medicine should be proven as clearly and distinctly as is required for the originality of a mechanical device. Under such a law an absolutely new chemical compound or an absolutely new alkaloid might be patented, and the discoverer have a pecuniary reward; but a mere mixture of well-known substances could not be patented, and almost the whole present race of patent and proprietary medicines would be wiped out of existence.

Solutions of acid phosphate were used long before the Rumford Chemical Company was born into existence. If the term acid phosphate or any other name can be made a trade-mark, we can see no reason why morphine, opium, quinine, or any such appellation now in common use, should not also be taken as a trade-mark. In this way a monopoly could be obtained of any of the simplest drugs.

The absolute need of some careful legislation upon the subject is further evinced by the attempt of Mr. E. Merck, a manufacturing chemist, for whom we have had the highest respect, to make a trade-mark of the words "hyoscin" and "homatropin," and prevent the use of these alkaloids when produced by others. Thus the following circular has been issued by Mr. Merck, and we suppose expresses the exact position which he is prepared to sustain:

"DARMSTADT, NEW YORK, } November 6, 1888.

"I herewith give public notice to whomsoever it may concern, that the names or words 'homatropin' and 'hyoscin' have, each of them severally, been registered as my trade-marks by the United States Patent-Office.

"Any trade-use made of either of these words, alone or in combination with other words or signs, for the designation of any chemicals or medicinal substances intended for sale or exchange within the United States of America, is therefore unlawful, and subject to the legal penalty for trade-mark infringement; unless such use has been previously authorized by me.

"Hence I caution all persons against employing, for commercial purposes, within the United States, any term —be it by advertisement, circular, letter, invoice, label, or otherwise—embodying either of the words thus protected; unless the words so used refer to chemicals made and sold by me, and to be resold by others under my brand and label.

"I intend to prosecute to the full extent of the law all cases of infringement of the above trade-marks that may come to my notice.

"E. MERCK."

It must be remembered that Mr. Merck did not discover the "hyoscin" chemically, nor did he make out its physiological action or its therapeutic use. Landenberg discovered the alkaloid, but it remained a mere chemical curiosity until it was investigated by Dr. H. C. Wood, who published his results in the THERAPEUTIC GAZETTE, January 15, 1885. As the result of these studies trials were made of the hyoscin all over the world, and it has become a much-used drug. If any pecuniary reward is deserved by any one for bringing forward the remedy, such reward by right belongs to the chemist Landenberg or the physiological clinician Wood.

We notice in the *Pharmaceutical Post*, November 18, 1888, page 751, that four of the manufacturers of sulphonal have formed a ring or trust; have trade-marked the name sulphonal in the United States, and only one sulphonal is handled by the agents of the trust, and this alone can be prescribed by physicians, or dispensed by pharmacists or supplied by the wholesale druggists.

The trust keeps the list-price of this sulphonal at two dollars, while other manufacturers than those represented by the trust would be able, if the name were not trade-marked, to furnish the article at about forty per cent. below said price, and place it on the market in this country at a much more reasonable rate than that adopted by the trust and its agents.

So the evil grows; what the end will be we do not know; whether the result will be a general debauching of the professional tone in the whole country, or whether the evil will in some way cure itself, time alone can show. But the evil has seemed to us so gross, and the prospect of a cure so slight, that we have been constrained to depart from the usual custom of the THERAPEUTIC GAZETTE, and, for the first time since it has been under the present management, to speak on an ethical subject. We have been further urged to do this by the hope that some of the excessive energy which is now expended in disputes concerning the relations between the regular and homœopathic professions may be deflected into a combat with some other important departures from the code by the profession.

PYRODINE—A NEW ANTIPYRETIC.

THE last addition to the list of modern antipyretics bears the name of pyrodine, and contains as its active ingredient acetyl-phenyl-hydrozin, its formula being $C_6H_5N_2H_2(C_2H_3O)$. According to Dr. Dreschfeld, who was the first to experiment with this remedy, one of the numerous derivatives of coal tar, it is a white crystalline powder, sparingly soluble in cold water, and, since it possesses very little taste, it is easily administered in this form. Doses of 8 or 12 grains on consecutive days produce no ill effects on healthy persons, and cause neither vomiting, nausea, and no effect on bodily temperature or urinary secretion, and no disturbance of digestion. Similar doses of from 8 to 12 grains produced marked reduction in temperature in from two to four hours in cases of pneumonia, scarlet fever, typhus and typhoid fever, and in cases of rheumatism. In the latter two groups of

cases pyrodine produced jaundice, hebetude, icteric urine, which occasionally showed the presence of globulin and albumen, and seemed to point to a mild form of hæmoglobinæmia, or even a destruction of the blood-disks, similar to that produced in aniline poisoning.

Pyrodine should never be given in larger doses than 12 grains, and only once in eighteen or twenty-four hours, and it is not safe to continue its use for more than a few days. If either of these precautions is neglected, serious or even fatal symptoms may be rapidly induced. As the use of antipyrin and other products for lowering temperature and relieving pain is becoming very extensive, we have thought it especially incumbent on us to warn the profession against the dangerous character of this latest addition to our therapeutic resources, and never to exhibit it except with the greatest caution and in the most critical cases of disease.

Nevertheless, pyrodine appears to be a more powerful antipyretic, both in degree and rapidity of action, than antifebrin, antipyrin, or phenacetin. The reduction of temperature lasts several hours, followed by a slight rise, and then a second spontaneous reduction, so that the action of a single dose may last an entire day. The reduction of temperature is accompanied by profuse sweating, but collapse, vomiting, or nausea do not appear to be noted, even when the reduction of temperature may be 4° C. The doses employed were from 3 to 4 grains given to children, 8 to 12 grains to adults.

Dr. Dreschfeld sums up the results of his investigation as follows (*Medical Chronicle*, November, 1888):

1. Pyrodine is a powerful antipyretic.

2. It reduces fever temperature quickly, and maintains the temperature at a low level for some hours.

3. It is easily taken, and produces marked perspiration, but no nausea, vomiting, or collapse.

4. It is especially applicable in cases of pneumonia, scarlet fever, and typhus. Given in small doses in the latter disease it enables the patient to pass through the fever period at a lower temperature range without delaying the crisis, and it seems also to shorten the period of convalescence.

5. It is less applicable in cases of typhoid, owing to the early exhibition of toxic symptoms.

6. It appears to act equally well in migraine and neuralgia, though on this point observations are as yet not numerous enough to admit of a definite opinion.

7. Given in often-repeated doses, at short intervals, it easily shows toxic properties, and these depend on the action of the drug on the blood, producing hæmoglobinæmia. It should not be given (unless the temperature be very high) oftener than once in eighteen or twenty-four hours, and it is not safe to continue its use for more than a few days.

8. It is found to act in cases where the other antipyretics have failed.

9. The dose for children is 2 to 4 grains; for adults, 8 to 12 grains.

10. It is a much more powerful antipyretic than either antipyrin, antifebrin, or phenacetin, but it is also much more toxic than these bodies. This disadvantage is, however, reduced by the fact that it is rarely necessary to give more than one dose in twelve to eighteen hours, as the temperature is kept low for a longer period than if any of the other antipyretics are given.

11. It reduces the pulse as well as the temperature, and often causes diuresis.

Experiments made by Dr. R. Wild as to the physiological action of pyrodine show that it has no effect on voluntary muscle, and but little on the isolated heart of the frog. It causes dilatation of the blood-vessels by acting on the spinal cord and not on the vessels directly. It has a paralyzing action on the central nervous system.

R. Lépine (*Lyon Médical*, December 9, 1888) has also experimented with this substance, which he has employed under the name of phenacethydrozine. In his experiments made on the frog and the guinea-pig he has noted a marked destructive action on the blood, although he did not attribute to it as high a degree of toxicity as Dr. Dreschfeld. Of two frogs, one was placed in a two per cent. solution of antipyrin, the other in a similar solution of pyrodine. The following day the first was dead, while the second did not appear to be affected. In guinea-pigs he has injected as much as 15 grains hypodermically per kilogramme body weight without producing death. After death the liver of animals who had received pyrodine for a number of days is less rich in glycogen than normal; their kidneys are yellowish, and their blood shows by the spectroscope the presence of methæmoglobin. Lépine has likewise employed this substance clinically in doses of 45 grains daily, with satisfactory results. Pyrodine reduces Fehling's solution not only when hot, as is common

to the hydrozins, but even when cold, and rotates the plane of polarized light to the right. Its solutions are not, however, colored brown by potash, and it reduces the subnitrate of bismuth less rapidly than glucose. It even reduces the nitrate of silver without heat, and communicates reducing power to the urine of animals to whom it is administered.

ARSENIC IN THE HOME.

UNDER the heading of "Arsenic in the Home," MR. A. W. STOKES gives in the *London Chemical News* results of some of his investigations. He examined a hundred samples of imitation Indian muslins and cretonnes. He found that twenty-three per cent. contained arsenic in appreciable quantities. The highest proportion, 2.1 grains of white arsenic per square yard. The colors in which arsenic was principally present were the terra-cotta reds and the greenish browns. In order to determine whether the arsenic would be given to the air by this preparation, he placed three hundred square inches, loosely folded, in a glass tube three and one-half inches long and three-fourths of an inch in diameter, and forced air through the tube for six hours, but was unable to obtain evidences of arsenic in the air. It would seem, therefore, that dresses made of such material would not give off to the atmosphere the particles of arsenic. The arsenic is, however, held very loosely by the muslin, for when it was dipped in the water, it yielded up a notable amount of the poison to the water. It probably is well known to most of our readers that sewing-silk of inferior grade is treated with a solution of lead to give it weight, and that every now and then seamstresses using this thread suffer from severe or fatal lead poison, the lead usually finding access through the mouth on account of the habit of biting the thread with the teeth. It is not surprising, therefore, that Mr. Stokes found in one shop six or eight girls who had been taken ill with ordinary symptoms of arsenical poison after having worked upon the arsenical muslin.

Of the wall-papers submitted to Mr. Stokes by various manufacturers ten per cent. were found to contain arsenic. Thirty other articles of household use, such as plushes, velvets, carpets, mats, silks, etc., were examined, and in only one sample—a little flax mat of green color—was arsenic found.

Happening to find a child playing with a small card-board box colored green, which had originally contained chocolates, Mr. Stokes was led to examine the surface paper of the box, and found in about seven square inches one-tenth grain of white arsenic.

Chronic metallic poisoning may have such characteristic symptoms that the practitioner should recognize their nature at once, but in not rare cases the manifestations are so obscure, that without a history it is impossible to know the exact nature of the case. Plumbumism or arsenicalism may be accompanied with albuminuria, and the presence of tube-casts and other symptoms similar to those of acute Bright's disease; indeed, within a few days, a case has come to us in which Bright's disease was diagnosticated by a capable physician, and the patient supposed to be almost hopelessly ill; but in which it was eventually discovered that the whole trouble was due to the inhalation of the fumes of arsenic.

There seems to us but one way of reaching the evil, and of preventing the use of arsenic in arts connected with the household,—namely, by the passage of laws which make it a criminal offence to use any form of dye-stuff that contains more than a minute proportion of the arsenic. It is plainly the maker of the goods rather than the retailer who is at fault: and if both the maker and the seller of the dyes themselves were liable to criminal prosecution, there would be some hope that the custom of using arsenic would be done away with.

THE PHONOGRAPH IN MEDICINE.

WHEN Edison first gave us the phonograph it seemed to have a no more promising future than that of an interesting philosophical toy; but it has gradually, through his untiring ingenuity, approached perfection, until Edison himself now gives it the name of "The Perfection Phonograph." The form which it now possesses is somewhat different from the earlier cylinder covered with tin-foil, in that now the cylinder is made of wax and is run by an electric motor. A diaphragm receives the pulsations of sound and impresses them upon the revolving cylinder, in exceedingly fine lines and dots, by means of a small pin pressing against the wax. When the record is completed, the repeating diaphragm is readily placed, the cylinder reversed, and the sound reproduced and conveyed to the ear by means of a tube. The phonograph is now so simple and so complete that it is rapidly replacing

stenographers in business offices, and, in addition, promises to have a useful part to play in physical diagnosis; as yet the scope of the experiments in this connection has not been very extensive. Dr. J. M. Bleyer has, however, made a number of experiments which seem to promise a great future for it in physical diagnosis and in clinical teaching. Thus, he suggests an application of the phonograph for recording the sounds in any given case of heart- or lung-disease, heard from day to day, and thereby rendering it possible to compare changes in the nature of the sounds and correctly appreciate the progress of the case; and such record will further be of value in consultation. Again, since it is possible to produce correct reproductions of heart and pulmonary murmurs, and to reproduce them at will an indefinite number of times, it furnishes an admirable means for keeping a record of cases; and since all sounds, both normal and pathological, may be correctly reproduced, and can be audible to numbers of persons, it furnishes an inestimable method for teaching purposes. It is yet too early to more than allude to the capabilities of this instrument, which promises, however, to be extended rather than restricted in its uses.

AN ERUPTION FROM THE USE OF SULPHONAL.

THE first objectionable result, trivial as it is, that we have seen reported as following the employment of sulphonal as a hypnotic, appeared in the practice of Dr. Engelmann (*Wiener Medizinische Blätter*, November 1, 1888) in the case of a woman, 40 years of age, suffering from chronic metritis with violent dysmenorrhœic pains, in whom sulphonal was given after chloral had failed to relieve the insomnia. 30 grains of sulphonal were given at bedtime; no hypnotic effect was noted, but on the following morning a diffuse scarlet-red eruption appeared, accompanied by itching, under both breasts. The red coloration of the skin was sharply separated from the normal skin and rapidly extended, so that on the evening of the same day it had covered the internal sides of both arms in a perfectly symmetrical manner and reached to the sternum; on the morning of the following day it had extended to the abdomen, and the eruption, which had been distinct on the two sides of the body, was now confluent. On the third day the eruption, which was now the seat of violent itching, gradually disappeared. It has been noted by Lesser that in the majority of cases the production of eruptions from the use of drugs is to be explained as attributable to vaso-motor disturbances, a theory which in this case appears to be sustained by the perfectly symmetrical character of the eruption.

Since writing the above a report has appeared in the *N. Y. Med. Journ.*, December 20, 1888, of the case of a physician, aged 53, a victim of the morphine habit, to whom 60 grains were given shortly after nine o'clock in the evening and 30 grains more an hour after midnight. Sleep did not follow promptly, but the patient shortly showed symptoms of muscular inco-ordination of a decided character. It took six days for the ataxia to subside entirely, and during a portion of that time there was great mental depression. The author infers that the action of sulphonal is not confined to the cerebral cortex, for in this case the ataxia was of central origin, inasmuch as the patient's condition was the same whether his eyes were open or closed.

A METHOD OF RENDERING ANTIPYRIN INJECTIONS PAINLESS.

M. DE FOUGERAY reports a method, which seems to us worthy of notice, of rendering subcutaneous injections of antipyrin perfectly free from pain. The plan which he employs is to half fill a hypodermic syringe with a fifty per cent. solution of antipyrin, which will amount to about five and a half grains; then immerse the syringe into a ten per cent. solution of cocaine, and enough of this solution should be drawn up into the syringe to make it about three-fourths full; this will amount to about one-third grain of cocaine. The two solutions readily mix in the body of the syringe, and no decomposition occurs, since the injection is at once performed. Further, it is important to choose a part of the body where the skin is loose and abundantly supplied with cellular tissue, and the needle should be quickly and deeply inserted into the cellular tissue.

Dr. de Fougeray states in the *Gazette Hebdomadaire des Sciences Médicales*, November 3, 1888, that he has employed this method in a large number of individuals, and it has always been unattended with pain, no accidents ever developing, no induration, and no ecchymosis.

POISONING BY COCAINE.

DR. MOIZARD reports in the *Revue Mensuelle des Maladies de l'Enfance* the case of a boy 4 years old, who was given by mistake 25 centigrammes (4 grains) of cocaine. After taking the dose the child was put to bed, and went to sleep; but in half an hour afterwards awoke with pale face, haggard eyes, irregular and difficult respirations, covered with sweat, and complaining of violent pains in the chest and violent cramps. Some minutes later he was taken with excessive muscular agitation, compared, by the reporter of the case, to the movements occurring in grave chorea. He threw himself on the bed from right to left, rolled under the covers, beat the bed with his head, arms, legs, etc. The pupils were largely dilated; the speech was short and broken, the child answering questions which were addressed to him. Later he was seized with a sort of intoxication, accompanied with hallucinations; he saw balls of fire and animals upon his bed. Sensibility was intact; the pulse was very frequent, but there was so much restlessness that it was not possible to count it. Two hours after the taking of the poison the symptoms were at their highest intensity,—great inspiratory and respiratory distress; cerebral trouble very accentuated. Under treatment with vomiting, and the administration of two injections, containing between 80 centigrammes (12 grains) of chloral, about two hours after the taking of the poison the agitation began to disappear. An hour later the child went to sleep, waking, however, several times during the night, with return of the choreic-like movements. Next day the symptoms had all disappeared.

Reports on Therapeutic Progress.

METHOD OF RAISING THE EPIGLOTTIS IN ASPHYXIA.

At the meeting of the Medical Society of London, held October 22, 1888, DR. BENJAMIN HOWARD read a paper which opens again the important question as to the best means to adopt when respiration fails under an anæsthetic. Dr. Howard maintains that the chief cause of the difficulty is the falling back of the epiglottis over the laryngeal orifice, and that the only way of obviating this is by extending the head and neck, the method of drawing forward the tongue being generally useless. These conclusions are not entirely in accordance with the results of previous observers, nor, we think, so far as lingual traction is concerned, with the experience of the majority of those engaged in the practical administration of anæsthetics. Sir Joseph Lister, so long ago as 1861, pointed out that the profound stertor of chloroform inhalation depended upon a laryngeal cause, the epiglottis not being folded back during the obstruction, and, though traction on the tongue abolished the obstruction and stertor, it did not in the least degree move the base of the tongue, epiglottis, or hyoid bone. Hence he believed that the benefit of lingual traction was not to be explained mechanically, but was developed reflexly through the medium of the nervous system. And in 1870 he referred to the value of forcibly pushing up the chin in cases where the tongue had fallen back. Since then the necessity both for elevating the chin and drawing forward the tongue has been frequently insisted on, the evidence, indeed, in favor of the latter practice being especially strong. The discussion of this most interesting subject has been deferred to a future meeting, when it is hoped that evidence on these points from those actively engaged as anæsthetists will be forthcoming.

The following is an abstract of Dr. Howard's paper: The epiglottis, as regards its functions, from the time of Plato to that of Magendie, was conspicuous as a subject of dispute. Respecting the epiglottis as a factor in apnœa, on the contrary, that which was taught at the first has been taught ever since, and is to-day everywhere the rule of universal practice. This teaching is,—1, that in apnœa the epiglottis falls backward and closes the glottis; 2, that the elevation of the epiglottis is the first thing in order and in importance, as without this respiration, whether natural or artificial, is impracticable and the result fatal; 3, the only way by which the epiglottis can be elevated is by means of the tongue; as the tongue is brought forward the epiglottis is moved upward. As a summary of results of prolonged and repeated investigations and experiments the author proposed to show: 1. The effect of traction of the tongue, what is done by it, and what is not done by it. 2. A new and only way of raising the epiglottis. 3. Some important changes in the relations of certain parts of the upper air-passages to each other, induced by complete extension of the head and neck. By the aid of a series of diagrams made by the author from sketches

he had made from nature he then showed: 1. Contrary to general belief, traction of the tongue, however and whatever the force employed, does not and cannot raise the epiglottis as supposed. Because (*a*) the tractile force supposed to be exercised upon the epiglottis is arrested chiefly by the frænum linguæ, and through the muscular fibres within is expended upon the inferior maxilla, into the genial tubercles of which they are inserted; (*b*) the surviving force is expended almost entirely upon, and intercepted by, the anterior pillars of the fauces; (*c*) for any tractile force which might survive a continuous and sufficient medium for its transmission to the epiglottis is wanting. Proof: The glosso-epiglottidean fossa being filled with water, the subject being so placed that the floor of that fossa is formed in part by the fallen epiglottis itself, traction upon the tongue, however forcible, does not cause the water to be spilled. As the author had just been publishing an improved way of seizing the tongue for the above purpose, this discovery was a great disappointment, and a great dilemma, as no other way of raising the epiglottis seemed to have ever been contemplated. After a search by no means easy or short, he discovered (2) the only way by which the epiglottis can be certainly raised, which is by extension of the head and neck. By this means its elevation is instant and complete; because (*a*) by a three-linked chain, of which the hyo-epiglottic ligament is the lower link, the body of the hyoid bone the central link, the combined genio-hyoidei and mylo-hyoidei muscles the upper link, the epiglottis is so coupled to the inferior maxilla, just where it has its greatest range of motion, that above a certain point, as the lower jaw is moved upward, the epiglottis instantly, irresistibly, and inevitably moves upward exactly in unison till it is erect. The customary wrenching asunder the clinched teeth, in proportion as it depresses the body of the lower jaw, antagonizes a distinct effort of nature to maintain the elevation of the epiglottis, and specially favors, sometimes helps, sometimes greatly increases, its depression. The author indicated on his diagrams the way in which other anatomical causes of obstruction in addition to the epiglottis respectively bar the air-way, for all of which he submitted a positive and complete remedy, and showed (3) the way in which by extension of the head and neck, carried to the utmost completeness, the backward fallen tongue, the velum palati, and uvula are all simultaneously shifted from the air-way, and the entire pharynx is enlarged throughout, as follows: *a*. The tongue, the dorsum of which before fell by gravitation upon the then horizontal posterior wall of the pharynx, falls upon the now horizontal arch of the palate. *b*. The velum palati, by means of the great tension of the palato-pharyngei muscles, is pulled away from the posterior wall of the pharynx, the entire membrane being stretched tightly forward and downward behind part of the dorsum of the tongue, forming a partition which helps to shut the tongue out of the pharynx and into the mouth, where it belongs, and with part of the dorsum forms the anterior wall of a new post-oral air-way, thus created and maintained. *c*. The pharynx, anteriorly, is stretched far forward by the extremely tense sterno-thyroidei muscles acting through the thyroid cartilage. By the genio-hyoidei and mylo-hyoidei muscles acting through the os hyoidei, the base of the tongue and the velum palati are shifted forward in the manner already described, the posterior nares being shifted by the extension of the head by its occipito-vertebral articulation about sixty degrees. Posteriorly, the wall of the pharynx is shifted back its whole length by the extension of the cervical vertebræ upon each other, in all about thirty degrees, the extension being particularly great just opposite the glottis. Thus the upper air-way, which before was a tortuous, angular, flaccid canal,—barely and, if at all, uncertainly permeable,—is made an enlarged, firm, but slightly-curved tube, free throughout, from the glottis to the nares. The way to make complete extension of the head and neck: Having, by bringing the patient to the edge of the table or bed, or, by elevation of the chest, provided that the head may swing quite free, with one hand under the chin and the other on the vertex, steadily but firmly carry the head backward and downward; the neck will share the motion, which must be continued until the utmost possible extension of both head and neck are obtained. Sometimes a slight elevation and extension of the chin merely will at once check stertor or irregularity of breathing; but, understand, the extension, which can in no case do harm, should be always rather more than appears necessary. It should never be forgotten, however, that the full effects of extension, as above described, can be secured with certainty only by making the extension complete as directed. That the customary pulling forward of the tongue is followed by relief, the author admits to be true in some cases, but in

some cases only, and then it is not by the raising of the epiglottis. In this stage, and in the case in which the backward fallen tongue happens to be the chief cause of obstruction, by pulling forward the tongue that cause of obstruction is removed, nothing more; but there are other cases, other stages, in which it does no good at all. From over thirteen thousand fatal cases of asphyxia in England alone during the last three years, the author selected over one hundred unequivocally attributed to the administration of anæsthetics, and in which, in all probability the tongue was skilfully pulled forward in the recognized way, but the patients died. The author would be sorry to pretend to state of what they died, but he could not avoid the belief that in each case the epiglottis in all probability was not raised, and continued unlifted until death was complete. It could not be thought a happy feature, that instruments, the delays in getting them, in using them, the occasional violence and the invariable wounding with them, yet the utter helplessness without them, were in the procedure submitted so entirely superseded. It was not pretended that never before had the epiglottis in this way been lifted. For more than twenty years the author himself had published and illustrated a certain position in the treatment of apnœa. This position inevitably opened the epiglottis, but he did not know it. The old-fashioned swinging of the feet, the *tête à bas*, the inversion of the entire body, the chucking under the chin, the jerking the angle of the jaw; in each of these the good done, and which was the only and all-sufficient reason for the habit, is an interesting corroboration. Each tended to raise the epiglottis, but the operator did not know it. Further corroboration is in the familiar position instinctively assumed by the croupous, the diphtheritic, the asthmatic, the dying. A diligent search has failed to discover a single record in which any observer states that by pulling forward the tongue he has seen the epiglottis raised. Nor is there a single reference to anybody who is supposed to have seen it. On the contrary, the facts here submitted have all been many times examined, and have been verified by distinguished anatomists at demonstrations made by the author at the Royal College of Surgeons, England, at King's College Hospital, and at Guy's Hospital; and at the Hospitals la Pitié and Salpétrière, Paris. The position of complete extension enables certain operations on the throat and pharynx to be done in anæsthesia, without the usual peril from drainage into the trachea. The sum of what has been submitted is: 1. That, contrary to universal belief, traction of the tongue cannot raise the epiglottis. 2. By sufficient extension of the head and neck, whether by volition, instinct, reflex action, or by the effort of another, whether in the healthy, the dying, or the dead, the epiglottis is instantly and beyond prevention made completely erect. 3. By complete extension of the head and neck the tongue and velum are as respiratory obstructions, simultaneously with the epiglottis, removed, and without a moment's delay the entire air-way can be straightened, enlarged, and be made free throughout by the nearest person. If syncope happen to be the chief or secondary factor, this also thus gets the quickest and best correction. The author expresses the hope, as he has the confident belief, that the facts submitted will be found to be permanent additions to our means of averting death.—*Lancet*, October 27, 1888.

MALARIA AND THE CAUSATION OF PERIODIC FEVER.

At the meeting of the Section on State Medicine, at the thirty-ninth annual meeting of the American Medical Association, recently held in Cincinnati, Dr. Henry B. Baker, of Lansing, Mich., read a long paper as to the "Causation of Periodic Fever," of which the following is a summary (*Journal of the American Medical Association*, November 10, 1888):

1. Intermittent fever is proportional, directly or inversely, to the average daily *range* of atmospheric temperature.

2. The *controlling* cause of intermittent fever is exposure to insidious changes, or changes to which one is unaccustomed, in the atmospheric temperature.

3. In the mechanism of the causation of intermittent fever, the chief factor is the delay in the reaction from exposure to cool air; this delay, extending to a time when greater heat-loss should occur, results in the abnormal accumulation of heat in the interior of the body, and in disturbed nervous action,—the chill; and the final reaction is excessive, because of the accumulation of heat and, sometimes, because it occurs at the warmest part of the day.

4. The fever is the excessive reaction from the insidious influence of the exposure to cool air; and it is periodical because of the periodicity of nervous action, and because the

exposure and the consequent chill are periodical, owing to the nightly absence of the warmth from the sun.

5. Residence in valleys or on low lands through which or upon which cold air flows at night, and thus causes insidious changes in the atmospheric temperature, favors intermittent fever.

6. *In our climate*, those measures, such as drainage, which enable the soil to retain warmth during the night, and thus reduce the daily range of temperature immediately over such soil, tend to decrease intermittent fever among residents thereon.

7. In the cure and prophylaxis of intermittent fever, those remedies are useful which lessen torpidity and tend to increase the power of the body to react promptly to insidious changes in atmospheric temperature.

8. The slowness of the pulse, and other indications of torpidity, associated with retention of bile or with certain disturbances of the functions of the liver, are well known; but, so far as known to the writer, these conditions have not heretofore been considered as causative of the fever in the manner herein suggested.

THE DEGENERATIVE EFFECTS OF ANTIMYCOTICS ON THE PARENCHYMATOUS ORGANS, WITH SPECIAL REFERENCE TO RENAL SURGERY.

At a recent meeting of the Berlin Medical Association a paper was read by DR. E. SENGER on the above subject, reported for the *Medical Recorder* (October 20, 1888) by Dr. John Elliott.

DR. ISRAEL said the thanks of the profession were due to Dr. Senger for his experiments on animals. Iodoform, especially indispensable as it is, must be carefully used on account of the mischief it may cause. Högyer, Binz, and Höpfl had all proved that the introduction of iodoform into rabbits, dogs, and rats had produced parenchymatous changes in the kidneys, liver, and heart, from the initial stages of cloudy swelling up to the highest degree of fatty degeneration. Post-mortem examinations had supplied the anatomical explanation of the symptoms of intoxication by iodoform. Cloudy swelling of the same organs, and, in one case, of the epithelium of the lungs, has been observed. Clinically, too, the effects of the drug in disturbing the action of the kidneys had been observed and recognized, partly in the form of albuminuria, and partly in the form of a full representation of the symptoms of diffuse nephritis. Although Israel cannot adopt Senger's pessimistic views, he agrees that a warning is necessary, and that antiseptics should be applied in a milder form. A step in this direction had been taken by Neuber, of Kiel, who irrigated recent, not infected wounds merely with a solution of common salt that has been boiled down. Further, Koeberlé and Lawson Tait had been eminently successful in abdominal surgery without using antiseptics. With fresh-operation wounds careful disinfection may be confined to the skin, hands, and instruments,—in short, to anything that comes into contact with the wound. Thus infection by contact is guarded against, and infection by the air is of no importance. It is quite a different matter when you come to prevent the spread of existing infection—*e.g.*, in phlegmonous processes—or to protect a recently-made wound in connection with communication with the intestine or cavity of the mouth from subsequent infection. In such cases chemical disinfection is indispensable. Perhaps a drug may still be found that shall destroy germs without injury to the organs. Israel says that Senger has totally misunderstood his hypothesis of reflex anuria, when he says that his theory is untenable in cases where there has been a cessation of urine secretion after extirpation of a kidney, for Israel had stated expressly "that in anuria after extirpation there is too great a complication of factors for us to regard it as a certain proof of reflex anuria." The cases, on the other hand, in which Israel maintains the probability of a reflex origin of anuria stand in no kind of relation to Senger's subject of the poisonous effects of antiseptics, for they represent the complete cessation of secretion in both kidneys in consequence of one-sided nephrolithic constriction in patients who have never undergone operation, and have, therefore, never needed the application of antiseptics.

DR. E. KÜSTER remarked that Senger had spoken in such a way as to leave the impression that surgeons relied on antiseptics without any just reason, and disregarded the dangers connected with their use. That might be true of the time when antiseptics were first introduced, before a knowledge of their nature became general. Even in 1875, at the Congress of Surgeons, few dared to point to the danger, and at the International Congress, later on, Lister utterly denied that there was any danger in using carbolic acid. With regard to sublimate and iodoform the

drawbacks were more quickly recognized. If, following Senger's advice, we were to throw the antiseptic treatment of wounds overboard, Külster says we might certainly avoid the dangers of antimycotics, but would incur the far greater danger of wound diseases. Senger is wrong in his description of the application of antimycotics.

Few surgeons during an operation keep up a stream of sublimate, generally, indeed, withdrawing it after the first incision, and only applying it at the end of the operation for a short time to the wound, from which it is then removed by sponges. Iodoform is usually applied with a sponge, which, having been rolled through it and then shaken, is carried lightly over the wound. If this method were dangerous statistics would show it. But the fact is that for six or seven years there have been no cases of iodoform intoxication. Even Von Bergman's so-called acid sublimate treatment is not accompanied by such danger as Senger describes.

Dr. Senger, in reply, said all operations might be divided into two groups. In the first group strong antimycotics were applied, and these were the less dangerous operations. In the second group weaker solutions, particularly of boric and salicylic acid, were used. Antiseptics were introduced with the intention of killing any fungi that might have settled in the wound,—in short, to disinfect. Antimycotic treatment was supported by the classical researches of Koch. Perhaps, however, it would be better, from the practical surgeon's point of view, to establish a basis by means of experiments in the disinfection of pus cocci. No doubt strong antimycotic solutions, such as sublimate and carbolic acid, destroy the staphylococcus aureus, but the weaker solutions do not effect this, though where they are employed there is a greater—nay, a fatal—danger from a faulty antisepsis. Just in such cases in which strong solutions should be applied they are inadmissible on account of the danger of poisoning; and, again, they are applied when they are much less needed. The theory and practice do not harmonize. To kill a pus coccus that has fallen into the abdominal cavity, washing with a four per cent. solution of boric acid is not sufficient, for you could let the man lie immersed in such a solution for five days and not accomplish that object. The same may be said of salicylic acid. Yet the results of operations in the abdominal cavity are excellent, and Senger believes that it is only necessary to wash the wound with sterilized water. He lays no particular stress on the common salt solution. The disinfection of a living tissue he considers to be impossible. Either the tissue is free from germs, in which case there is no need of an antimycotic, or it is infiltrated with pathogenic fungi, in which case it is impossible to destroy the fungi without at the same time seriously injuring the tissue. Disinfection answers admirably on dead objects, but in the case of living organs more importance must be attached to vital energy. Did not Virchow, at a time when it seemed as if the whole of pathology depended on pathogenic bacteria, especially direct attention to the conflict between the cells and bacteria? Surgical examination showed this in wounds in connection with syphilis, tabes, diabetes, and other exhausting diseases, so that, in spite of the strongest antiseptics, it was impossible to prevent purulence and purify the wound, because the energy of the cells had much abated and disinfection was impracticable. By all means let dead objects, such as instruments, the operating-room, etc., be thoroughly disinfected, but after the first incision no antimycotic whatever should be used. In how far these theoretical demands can be met in practice must be decided by those who have great opportunities of practice. The latter alone can determine the cases in which antimycotics are indispensable, but the general rule of avoiding their use should be observed.

ANTHRAROBIN.

In the March number of the *Vierteljahresschrift für Dermatologie und Syphilis* of this year, a new remedy was introduced to the profession by the Berlin chemist, Liebermann, as a substitute for chrysarobin and pyrogallic acid. In its chemical relations the new drug closely resembled chrysarobin. As is well known, it was the same distinguished chemist who first demonstrated the fact that the substance obtained from Goa powder, that is now appreciated as so potent a remedy in various epidermidoses, was not, as Attfield had erroneously supposed, chrysophanic acid, though by oxidation it could be readily converted into the latter, and to it he gave the designation by which it is now commonly known. Liebermann attributed the therapeutic effect of chrysarobin to the fact of its being a strong reducing agent. Pursuing his investigations while entertaining the above view, he has recently sought to discover other substances which, with like chemical properties,

should have a similar therapeutic action. Among the substances belonging to the same chemical class as chrysophanic acid is alizarin. By a simple process of reduction he has obtained from this substance a product which he terms "anthrarobin." Like chrysarobin it is a powerful deoxydizing agent, one gramme being capable of absorbing one hundred and twenty cubic centimetres of oxygen. In appearance it is a light brownish-yellow granular powder. It is very sparingly soluble in chloroform or ether, as is chrysarobin, but, unlike the latter substance, it is readily soluble in alcohol and also in weak alkaline solutions. The alcoholic solution is of a deep-brown color. Hot glycerin also dissolves it, and it remains in solution though it is but slightly soluble in cold glycerin. With fats it mixes readily to form ointments.

It remained to put to a practical test the theoretical claims made by its discoverer for this new drug, solely on the ground of its chemical resemblance to remedies already in successful use. The task was undertaken by Behrend, and his results are published simultaneously with those of Liebermann in an immediately succeeding article. The report of cases treated by anthrarobin include fifteen of psoriasis, seventeen of herpes tonsurans, two of erythrasma, and one of pityriasis versicolor. In all of these the success of the treatment was exceedingly satisfactory. In its efficacy the remedy seemed to occupy a middle ground between chrysarobin and pyrogallic acid, being more efficacious than the latter, but somewhat slower in its action than the former. A very noticeable fact about it was the entire absence of irritation. Most of the cases were treated with a ten or twenty per cent. tincture. In most of the cases of psoriasis, before applying the anthrarobin the patches were thoroughly rubbed with green soap or with spiritus saponis alkalinus, which procedure was found decidedly to increase the energy of the therapeutic action. It had been stated by Liebermann that the presence of an alkali increased the reducing effect.

In the *Journal of Cutaneous and Genito-Urinary Diseases* for November, 1888, Dr. E. B. BRONSON publishes a paper, read before the Dermatological Section of the Congress of American Physicians and Surgeons at the recent meeting in Washington, in which he details a series of experiments as to the value of anthrarobin in the treatment of cases of psoriasis. In order to better test the comparative effect in each case, the right half of the body was treated with anthrarobin, the left half with chrysarobin. A ten per cent. ointment in vaseline being employed on either side, and once a day, before the applications, the patient was given an alkaline bath. The eight cases treated in this manner by Dr. Bronson sufficed to corroborate the results obtained by Behrend. In five of these cases by the end of the first week the improvement of both sides was decided, but in every case it seemed as though it began a little earlier on the right (the anthrarobin) side than on the left. By the end of the month every case was apparently healed, excepting perhaps a slight patch here and there, as upon the elbows, knees, or ankles. In all of them the psoriasis had been general. It further appeared that the cure produced by the anthrarobin was less permanent than that produced by the chrysarobin. In the three remaining cases the progress was most rapid and certainly began on the side treated by chrysarobin. In all of them the dermatitis excited by the chrysarobin was pretty decided. It is to be noted also that in these last three cases the alkaline baths which were employed in the first five were omitted, with the object of avoiding some of the deep discoloration which the anthrarobin produces on the skin. As soon as the alkaline treatment was resumed the progress on the right side became much more rapid. With regard to the staining caused by the drug, it is of a dark-brown color, and much deeper than that produced by chrysarobin. On the other hand, it does not tend, like the latter, to diffuse itself over the surrounding skin. When used in the form of tincture it remains circumscribed within the area to which the application is made. Any irritation produced by the ten per cent. preparations of anthrarobin was scarcely appreciable. In one or two of the cases of psoriasis, after continued use, a slight redness was noticed over limited portions, but always so near the region inflamed by the chrysarobin as to leave it doubtful whether it was not due to an invasion of the inflammation from the left side. In some other cases, especially cases of eczema, a slight smarting sensation was produced at the first application of the remedy. That it is capable, however, of causing irritation was abundantly shown in one case treated by a twenty per cent. ointment. It was the case of psoriasis already referred to, in which a recrudescence of the eruption occurred, more particularly on the right side, after the patches in this region had apparently all been healed. After this stronger

ointment had been continued for about a week, a diffuse dermatitis was excited, differing in no way from that produced by chrysarobin. But for this single observation, he should have regarded the remedy as almost devoid of irritating properties.

Being desirous of further testing the keratoplastic virtues of anthrarobin, a number of cases of eczema were treated with this substance. All of them were subacute or chronic cases, or cases that had already been brought to a healing stage by means of other remedies. In one case of universal eczema, which had been treated at first by linseed-oil applications and later with tar, while the general surface still remained red, hard, and pityriasic, the anthrarobin was employed in the form of a ten per cent. ointment with considerable apparent benefit. During its use the desquamation and redness subsided, but a condition resembling lichen pilaris was produced, together with the production of numberless minute comedones. After several days' use it was stopped on account of itching complained of, and a return was made to tar and alkaline baths. Shortly after, the skin appeared perfectly normal, with the exception of a few irritable and excoriated patches about the legs. In very chronic and inveterate cases of eczema seborrhoicum the effect of the drug was still more marked. The disease had persisted for several years. For three years, on account of it, the patient had been an inmate of the hospital. It affected the scalp, both cheeks, and the chest in the region of either nipple. The patches varied in appearance at different times from that of a seborrhœa sicca, or a simple keratosis to that of moist or desquamating eczema rubrum. Under various forms of treatment it had shown itself uncommonly persistent, and nothing had ever succeeded in doing more than to temporarily ameliorate the condition. After a few days' application of a ten per cent. anthrarobin tincture, it was evident that a considerable change for the better had taken place. The crusts no longer formed, and the patches seemed to have diminished in extent. There were, however, some spots of moist excoriation, and fearing lest the drug might irritate too much (though there was no distinct evidence that inflammation had been excited), it was directed that for a couple of days only Lassar's paste be applied. The former treatment was then resumed in the following manner: every second day a ten per cent. ointment of anthrarobin was applied; on the alternate days the surface was treated for fifteen minutes with oil of cade, which was washed off and Lassar's paste applied. When last seen, while not healed, the condition appeared very favorable to recovery.

In four or five other cases of eczema in which the remedy was used, while it was not sufficiently relied upon to precisely test its curative effect, in no instance was there any evidence that the disease had in any way been thereby aggravated. It seemed, however, to possess little or no antipruritic effect. In three cases of general pruritus in old men, in which it was employed experimentally, no appreciable benefit was derived. In one case, in which an ulcer of the leg was slow in "skinning over," the application of Lassar's paste containing five per cent. anthrarobin appeared at once to stimulate the process, and the sore soon healed.

THE MORTALITY OF ABDOMINAL SECTION.

At the meeting of the Royal Medical and Chirurgical Society, held October 23, 1888, Mr. W. A. Meredith read a paper entitled "Remarks on some Points affecting the Mortality of Abdominal Section, with Tables of Cases," of which the following is an abstract (*Lancet*, October 27, 1888): The purpose of the paper was to draw attention to certain points affecting the present death-rate after abdominal section, and with this view operations for ovarian growths were chosen as being to some extent representative of the entire subject under consideration. As a basis for the inquiry, the results of the author's own work in this connection, amounting to one hundred and twenty-six operations, were examined with regard to the chief causes influencing the mortality, special reference being made to the ten deaths which occurred in the series of one hundred and four completed ovariotomies. All the operations were performed with strict antiseptic precautions, including the use of carbolized spray. He was now less inclined than formerly to look upon the latter as an absolute essential to the safeguards of antiseptic abdominal surgery, but he still considered it valuable as the most convenient and effectual means of antiseptic irrigation at our disposal when dealing with peritoneal cavity. Both ovaries were removed in seventeen cases, two of which terminated fatally, but in neither instance was the result in any way attributable to the removal of the second ovary. Complete enucleation was performed in five cases, all successful, the result-

ing rent in the broad ligament being closed by a continuous silk suture. He advocated the use of the drainage-tube in all cases of ruptured or inflamed cysts, in any case where irritating or septic fluid had escaped into the peritoneum, in all operations complicated by serious injury to bowel or urinary bladder, in every instance where washing out had been resorted to, and in all cases of severe operation in middle-aged or elderly women. For washing out the peritoneum, where necessary, he advocated the use of plain, recently-boiled water, cooled as required by the addition of a saturated solution of boric acid. Discussing the mortality, he was inclined to believe that in large series of cases the average death-rate would never be less than five or six per cent. Of the ten deaths in his series, two were from septicæmia, one from intestinal obstruction, one from hemorrhage, one from dysenteric diarrhœa, two from chest complications, and three from exhaustion; three of these deaths were from preventable causes. Twelve successful operations for the removal of diseased uterine appendages were next reviewed. In seven patients, in whom both appendages were removed, complete arrest of menstruation followed. He had found that in cases of chronic ovarian mischief about ninety per cent. were the subjects of obstinate constipation, and in them tonic purgative treatment, by lessening pelvic congestion and preventing the formation of scybala, was followed by marked relief of symptoms. Included in a series of ten exploratory operations were two incomplete ovariotomies. Both patients had been tapped, and the death of one was directly due to the difficulties encountered in the attempt to separate universal adhesions which had resulted from this treatment. In conclusion, it was shown that the increased success of abdominal section for ovarian disease during the past ten years was chiefly attributable to the diminution in the number of deaths from septicæmia. For purposes of comparison he took three successive groups of operations, which represented three separate periods during the last twelve years, and gave their average death-rate from septicæmia alone. In one hundred consecutive cases taken from Sir Spencer Wells's work, when the clamp was used, and before the employment of antiseptics, the mortality was ten, or one to every ten patients. In one hundred and fifty cases recorded by Mr. Thornton in the sixty-fourth volume of the "Medical and Chirurgical Transactions," which were treated antiseptically and with intra-peritoneal ligature of the pedicle, there were five deaths, or one to every thirty patients. In his own series of one hundred and four cases there were two deaths, or one to every fifty-two patients. The chief factors which had contributed to this increased success, he thought, were as follows: 1, the general adoption of the intra-peritoneal treatment of the ovarian pedicle; 2, the application of the antiseptic system to abdominal surgery; 3, the gradual abandonment of the practice of tapping abdominal cysts; 4, the increase in our knowledge respecting the proper use and management of the drainage-tube; 5, the recent introduction of the plan of freely washing out the peritoneal cavity in cases complicated by the extravasation of blood or other fluid.

Mr. Alban Doran had seen great advantages follow both the antiseptic and the non-antiseptic systems of treatment. He thus summed up the influences which he thought contributed to lessening the mortality after ovariotomy: The skill and experience of the operator; early operation; a good hospital and efficient nurses, among the latter emulation being a great factor in favor of good results; the use of antiseptics, not only for their own value, but because they drilled the operator into habits of forethought; drainage, when the tube was frequently pumped out; and gently flushing the peritoneum with a great bulk of warm fluid, which checked hemorrhage, washed out clots, and prevented shock by keeping the peritoneum warm. He condemned the use of a ward nail-brush, which he believed to be a frequent carrier of infection.

Mr. Knowsley Thornton objected to stitching up the rent in the peritoneal capsule after enucleation. A number of small vessels were torn; hemorrhage or serous effusion might occur into the sac, which led to tension, nerve disturbance, inflammation, and suppuration. If the rent were left open the case did much better, as the fluid flowed into the peritoneum and was rapidly absorbed. Tapping of cysts should not be resorted to, the escape of fluid in some cases leading to infection of the peritoneum. Ruptured cysts rarely needed drainage if carefully sponged out. He thought that flushing often acted by breaking up septic material into tiny particles, which were unable to defend themselves against the power of the peritoneum. He maintained that efficiently performed oöphorectomies always stopped menstruation. In cases of ovarian disease it was only necessary to remove the troubled ovary or tube,—not both. It was sufficient

to empty the drainage-tube once in twelve hours under the antiseptic method, but to do so every hour was not too often where no antiseptic was used.

MR. MEREDITH replied that he did not consider the opening made in the broad ligament to enucleate a cyst was comparable with the peritoneal wound made in the removal of a kidney. Women at the menopause were passing through a critical time, when kidney-trouble often developed, which would hinder ready absorption of peritoneal fluid; he was, therefore, inclined to extend the advantage of drainage to them. Flushing out the peritoneum not only checked hemorrhage, but also avoided the undue irritation of the membrane caused by excessive sponging.

THE EMPLOYMENT OF ANTIPYRIN IN HEMORRHOIDAL TUMORS.

DR. J. SCHREIBER reports the case of a man, 72 years of age, who had for a number of years suffered from hemorrhoids, which had been more or less successfully treated a number of times by cauterizations with the nitrate of silver. The remedy, however, gave such pain that the employment of astringent applications of alum, sulphate of zinc, oxide of zinc, and suppositories of cocaine, morphine, and belladonna were employed, with but transient relief. Dr. Schreiber then tested the results obtained from the application of antipyrin, reduced to a powder, applied around the anus and introduced into the rectum. This application, for a few seconds, produced slight pain, but was followed by relief which lasted for twenty-four hours. This application was repeated, at first daily, and then twice daily; and at the end of about three weeks the appearance was much better, and six weeks later cure was obtained.—*Revue des Publications Médicales*, November, 1888.

THE POSSIBLE DANGER OF PARALDEHYDE IN CHRONIC EMPHYSEMA.

The physiological action of the polymeric paraldehyde was first worked out by Cervelló, who showed its advantages over chloral as a hypnotic in that it does not paralyze the heart, the few cases in which the cardiac depressions appear to be produced being explained as the consequence of its depressing effect on the respiration. Since then it has been much used clinically, and, although it has not proved a powerful hypnotic, its use has until now, as far as we know, been attended by no bad results.

In the *Practitioner* for November, 1888, MR. H. D. ROLLESTON reports the case of a woman admitted into St. Bartholomew's Hospital suffering from advanced emphysema, slight bronchitis, and dilatation of the right side of the heart. Her face was dusky, and the distension of the veins of the neck and chest showed that considerable venous engorgement existed. There was no cardiac murmur. The respirations were rapid, numbering 60 to the minute. As she suffered from sleeplessness, she received one drachm of paraldehyde, with one drachm of tolu, in an ounce of water. An hour later she became rather suddenly dyspnœic and collapsed; the respirations were 80 and shallow; the pulse 156 and weak. 2 drachms of ether were given, and a poultice was applied to the chest, and four leeches to the bottom of the sternum. The paraldehyde made her sleepy, and she was delirious, but her pulse and respiration improved, and two hours later she became calm and her respiration quiet. The alarming symptoms were at first not believed to be due to the administration of paraldehyde, but about two weeks later a similar dose of paraldehyde was administered, and precisely similar symptoms were produced. The improbability of severe dyspnœa and collapse occurring after paraldehyde as a mere coincidence on two occasions makes the relation between the two appear to be causal. Mr. Rolleston's case is, therefore, of interest, as leading to the suspicion that the drug is not without danger in cases where the respiratory centre is depressed, and some degree of cyanosis is already present, especially since experiments on animals seem to indicate that toxic doses produce death by paralysis of the respiratory centre.

THE ACTION OF HYDROFLUORIC ACID IN THE TREATMENT OF PULMONARY PHTHISIS.

M. HÉRARD, in the name of a Commission consisting of himself and Drs. Féréol and Proust, presents a report (*Bull. de l'Acad. de Méd.*, No. 47, 1887) on the subject of the treatment of phthisis by means of hydrofluoric acid. He points out that the immunity from phthisis of glass-blowers and others exposed to the vapors of the acid has been observed for a long time past, and that efforts were made even in 1862 by Bastien, and afterwards by Charcot, to bring the therapeutic

action of the acid into practice in cases of phthisis. In 1885, Drs. Seiler and Garcin again pointed out that it possessed strong antifermentative and antiseptic powers, and more recently experiments have been made by Martin, showing that the acid, even in great dilution, is able to nullify the growth of bacilli in cultivations; while experiments on animals, by which the vapor has been introduced by inhalation, have shown that the phthisical process may thus be effectively hindered. For the treatment of human beings it is necessary that the vapor should be diffused in a more or less accurately closed chamber, and that the inhalations should be continued for an hour at a time. The best results have been obtained by this means, the appetite being very rapidly recovered, and all the other common symptoms being relieved in a large proportion of the cases. Of one hundred cases, thirty-five are stated to have been cured, forty-one improved, fourteen unaffected, and ten died. The first effects of inhalation were to produce cough, but this difficulty was, as a rule, very rapidly overcome. Dr. Charles Jarjavay (*Bull. Gén. de Thérap.*, March, 1888) collates the various methods that have been recommended for the inhalation of hydrofluoric acid. In all of these the acid is, of course, stored and manipulated in gutta-percha vessels. Where a special inhaling chamber can be contrived, the vapor may be driven into it by means of atmospheric air forced through a mixture of the acid and water in various degrees of dilution. Simpler portable contrivances have been employed, consisting of a bottle containing the mixture of acid and water through which the air may be drawn by means of an india-rubber tube, and inhaled direct; or of a bag containing a definite quantity of air, which is connected by tubing with the acid bottle, two wash-bottles being interposed between the acid bottle and the inhaler. A definite volume of air is thus drawn through the whole apparatus until the air-bag is exhausted. The strength of the acid solution varies from fifteen to twenty or thirty per cent. Dr. E. Goetz (*Revue Méd. de la Suisse Rom.*, No. 8, 1888) contributes a note on the action of hydrofluoric acid in the treatment of phthisis, in which, after full recognition of preceding work, he advocates the careful trial of the remedy as one which is, at any rate, simple and innocuous, and may greatly contribute to the recovery of early cases. He points out that in this, as in every other form of inhalant, the strength must be so graduated that long-continued inhalations can be practised without discomfort. Inhalations that are painful or in any way distressing to the patient are of very little value in practice, as they can never be long continued. Hence no positive standard can be laid down for the strength of the acid to be used in each case. The first sensations on inhaling the vapor are always somewhat irritating to the nose and fauces, but toleration is quickly established, and patients are soon able to inhale the vapor for an hour continuously. The remedy has been most successful in the early cases, and the first notable improvement is always in the appetite. Dr. Goetz notes that night-sweating is diminished, but that the fever is not always reduced in proportion to the improvement in other directions, nor do the number of bacilli diminish to any material extent. The same may be said of the local physical signs. Cough is not very much affected, but the sputa, as a rule, become less profuse. Diarrhœa and laryngitis are not much affected, being generally met with in the case of advanced disease. The inhalation after the first few moments is attended with pleasant sensations, and patients always express themselves as being better for it at the time. Without predicting a great future for the treatment, Dr. Goetz claims that it may rank as a true therapeutic advance.—*London Medical Recorder*, October 20, 1888.

THE RAPID CURE OF ANAL FISTULA.

Dr. Longo concludes his thesis with the following statements (*Bull. Gén. de Thérap.*, November 15, 1888):

1. The method ordinarily employed in the cure of anal fistula, while not entirely exempt from risk, necessitates constant attention for at least thirty days, and predisposes to relapse. 2. From the employment of the antiseptic method, a method of cure is possible in which the result may be attained in a much shorter time. 3. These processes, already employed with considerable success, consist essentially in the entire excision of the fistulous structure and the reunion by the first intention of the outer surfaces. 4. Cure is ordinarily obtained within ten days. 5. The majority of fistulas are amenable to this treatment, which is exempt from danger, which is usually not followed by relapse, and whose employment is not accompanied by any insurmountable difficulties, with the single exception of the rigorous application of the

antiseptic method. 6. When the fistulas are united, accompanied by extensive development of pathological tissue, or when their rectal orifice is situated very high up, or when the fistulas are accompanied by hemorrhoids, —then only is this method not applicable.

ESERIDINE.

"Eseridine" is the name that has been given by HERR EBER to an alkaloidal substance said to occur already formed in the calabar bean, and also to be producible from physostigmine. According to a recent paper (*Pharm. Zeit.*, October 13, p. 611), when physostigmine is treated with sulphurous acid or grape-sugar alkali, two compounds are formed,—one giving a violet color with hydriodic acid, apparently the compound named "inactive physostigmine" in a previous paper (*Pharm. Journ.*, September 1, p. 161), and the other the "eseridine" in question, which liberates iodine energetically. The relative yield appears to depend upon the intensity of the chemical action, the proportion of the iodine-liberating compound being preponderant when sulphurous acid is used, and that of the other compound when grape-sugar alkali is used. Eseridine is only sparingly soluble in water, and soluble salts have not yet been prepared; in some subcutaneous experiments made to test its physiological action, it was therefore brought into solution by the addition of dilute sulphuric acid. From the results on animals it was inferred that eseridine resembles physostigmine in its laxative action, though without disturbance of the cerebral nervous system, and that it is an irritant of the spinal cord, but not cumulative in its action like strychnine. The dose required to produce toxic results was six times greater than that of physostigmine. Herr Eber appears to claim certain advantages for eseridine over physostigmine on the ground that it is permanent in solution, six times less poisonous, and that it acts upon the bowels with a minimum of disturbance of the nervous system. Whether these claims are well founded must be proved by experience, as also probably its right to be deemed a new discovery. The alkaloid is prepared in a crystalline form by Messrs. Boehringer, of Manheim, who have published some further information concerning it, according to which its composition is represented by the formula $C_{15}H_{23}N_3O_3$, or as containing a molecule of water more than the physostigmine, from which it is derived, and into which it can be reconverted by suitable treatment with an acid. It also differs in being sparingly soluble in ether, in which physostigmine is very soluble.—*Pharmaceutical Journal and Trans.*, November 3, 1888.

SULPHONAL AS A HYPNOTIC.

In the *New York Medical Journal* for December 15, 1888, DR. WILLIAM H. FLINT reports thirty-three cases of insomnia in which sulphonal was employed, special stress being laid in the investigation as to the primary disease of the patient suffering from insomnia; his previous history; the dose of sulphonal administered; the hours elapsing after the exhibition of the drug before sleep ensued; the duration of sleep, its quality, and the after-effects of the remedy.

The sulphonal was administered in powdered form, enclosed in capsules, given usually at the bedtime of the patients. In order to prevent mental impressions from influencing the results, the patients were not informed of the nature of the drug or its expected action. The general conclusion which may be drawn from these reports is that they confirm the early observations as to the great hypnotic value of sulphonal, and show that, even in single doses of 20 or 30 grains, it is a safe and, in the main, reliable hypnotic, free from unpleasant concomitant effects, and usually from all undesirable sequelæ. The single objectionable after-effect witnessed by the writer has been moderate somnolence on the morning following the administration of the remedy.

In none of the cases has there been the slightest derangement of appetite or digestion, nor have the circulation and respiration been appreciably affected at the time of awaking. The cutaneous and renal secretions have neither been increased nor diminished; nausea, vomiting, and constipation have not followed the use of the drug. Several of the cases seem to show that an increase of the original dose is often not required, and that, after a certain time, natural sleep being restored, the sulphonal may be discontinued. This is the only light thrown by the writer's cases upon the important question as to the possibility of engendering a sulphonal habit or of prejudicially affecting the organism by the continued use of sulphonal. The doctrines that sulphonal is of exceptional value in insomnia occasioned by debility, neurasthenia, and mental perturba-

tion, and that it has no appreciable anodyne properties, receive support from the history of several of these cases. In several cases the pain of acute rheumatism, of pelvic peritonitis, of chronic rheumatism, of sciatica, and of dysentery was not sufficiently controlled by the remedy to permit of quiet sleep. On the other hand, the pain of splenitis, of cerebral gumma, of pharyngitis, and of alcoholic gastritis was not of sufficient violence to prevent the patients from sleeping under the influence of sulphonal. The effect of sulphonal was particularly fortunate in the cases of those patients who had previously been addicted to the use of opium and of other hypnotic drugs, or were suffering from insomnia due to the withdrawal of these remedies. In cases of insomnia due to the dyspnœa of cardiac and Bright's disease, sulphonal was powerless to produce sleep, and morphine was alone perfectly adequate to meet the indications. In a case of cardiac dyspnœa, the hydrate of amylene proved fairly successful. In cases where the insomnia was occasioned by the harassing cough of pulmonary tuberculosis, under the influence of sulphonal, the patients slept better than usual, and although the cough continued during sleep, they were not awakened by it. Sulphonal also rendered excellent services in the insomnia of typhoid fever.

The average length of time at which sleep ensued after the administration of the sulphonal was about an hour.

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The high average of successes, in a series of unselected cases, many of which were plainly unsuitable for experiment with a pure hypnotic, encourages the writer to publish this record in the hope that it may aid in hastening the general introduction of sulphonal.

STRYCHNINE AS AN ANTIDOTE IN NARCOTIC POISONING.

It is universally recognized that narcotic drugs in lethal doses produce death through paralysis of the respiratory centre, and it appears difficult to account for the fact that strychnine, the most powerful stimulant to that centre which we possess, should not be recommended as part of the routine treatment for all narcotic poisons. Atropine for the present is allowed to hold this position, but there is a stage in opium-poisoning at which the use of this drug is fraught with danger, and a patient may pass away in a condition of profound narcosis in which the action of atropine preponderates over that of the original poison.

Strychnine has long been used as an antagonist to chloral in cases of poisoning by that drug, and the similarity in many respects between the effects of chloral and of opium led Dr. G. A. Gibson to employ strychnine in order to counteract profound opium narcosis (*The Practitioner*, December, 1888).

In a number of cases of narcotic poisoning which came under Dr. Gibson's care, strychnine was used hypodermically when there had been any irregularity or interruption of the breathing, and the effect of this drug was immediately shown by the increased rate, more regular rhythm, and greater depth of the respirations; while even in cases where the breathing had ceased, Dr. Gibson states, it has again commenced after the administration of the strychnine.

Dr. Gibson takes exception to the general treatment of narcotic poisoning given in the ordinary books, and contributes the following as the best method of treatment in such cases.

The chief indications in all such cases are two in number: first, to remove any of the poison that may be within reach; and, second, to sustain the activity of the vital centres, especially that concerned in the maintenance of the respiration, until the poison which has been absorbed is eliminated.

The first indication can most perfectly be met by washing out the stomach by means of the siphon-tube, which is at once more convenient and more thorough than the stomach-pump. If neither siphon nor stomach-pump should happen to be at hand, a tablespoonful of mustard in half a pint of tepid water, or 20 grains of zinc sulphate in a similar quantity of water, may be administered. In suicidal cases, however, the exhibition of such remedies is as a rule wellnigh impossible, and for these, as well as many other cases, the hypodermic injection of $\frac{1}{10}$ of a grain of hydrochlorate of apomorphine, which may always be kept ready in the form of tabloids, is necessary. By one or other of these methods the last trace of the drug may be removed from the stomach. If the siphon or stomach-pump has been employed, a pint of strong black coffee should be introduced before it is withdrawn, or, if neither can be used, it may be given by the rectum.

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The next indication is to keep the vital centres in a state of activity, while at the

same time doing nothing that can in any way cause exhaustion of any part of the system. Here we have at our command several means of rousing the centres, which may be used in turn according to circumstances. It is well as a rule to keep the patient awake by asking questions or issuing commands in a loud voice. If this is not enough, the same end may be attained by tapping the forehead with the tips of the fingers, pinching the arms and legs, or pricking the skin slightly with a needle. If these are not sufficient to prevent the appearance of sleep, the cold douche may be used; but in Dr. Gibson's opinion the employment of cold is as far as possible to be avoided. A far more efficient mode of rousing the patient is to be found in the application of mustard-leaves to the calves, and in the use of the interrupted or induced current, as by such means powerful stimuli may be administered without the possibility of aiding the depressing effects of the poison.

One method of keeping the patient awake must emphatically be condemned,—namely, that of making him walk about, as is still to be found recommended in some of the text-books. This method used to be in vogue at some of the hospitals, and was carried out by means of relays of policemen specially told off for the duty. The patient was marched round the waiting-room between two of them, and was followed by the resident-physician or clerk in charge of the case, whose rôle was to flick the calves with a wet towel, if there be any signs of flagging energy on the part of the patient. This mode of preventing the patient from sinking into slumber has a great tendency to exhaust the vital powers, and has almost everywhere been rightly abandoned.

Another method commonly adopted in such cases must also be at least strongly denounced, —namely, the administration of alcoholic stimulants. These aid the action of narcotics, and must be studiously avoided.

Keeping the patient in the horizontal position, the respiration is to be carefully watched, and if there should be the least sign of irregularity, or shallowness, or inequality in the breathing, $\frac{1}{100}$ or $\frac{1}{60}$ of a grain, according to the age of the patient, of sulphate of strychnine should be administered subcutaneously, and may be repeated at intervals of an hour two or three times. If, in spite of the strychnine, the respiration becomes very feeble or ceases entirely, artificial respiration must be commenced promptly. The most convenient method to employ is that of Sylvester; and it should be persisted in until, on the one hand, the respiration is carried on by natural means, or, on the other, the heart has for half an hour ceased to beat. If any one who reads these remarks should employ strychnine in the manner above described he will be struck by the immediate improvement in the respiration which follows its administration.

If the circulation threatens to fail in consequence of the poison affecting the motor mechanism, or of spasm of the arterioles caused by deficient oxygenation of the blood, it also will require prompt attention. The use of the strychnine is of service as a stimulant to the motor centres of the heart, and may be aided by the employment of ammonia or ether; while if artificial respiration has been thoroughly performed there should be no spasm of the arterioles; but in the event of such an occurrence recourse must be had to nitrite of amyl.

Although special reference has been made in these remarks to narcotic poisoning, it must be added, in conclusion, that in cases of danger from failure of the respiratory centre, caused by the general anæsthetics, the employment of strychnine is likewise of the greatest importance.

THE INCOMPATIBILITY OF SPIRIT OF NITROUS ETHER AND ANTIPYRIN.

It has been noted by Knorr, the discoverer of antipyrin, that it is incompatible with spirits of nitrous ether containing free nitrous acid; it resulting in the formation of nitrous antipyrin and water. In dilute solutions a green color attends this reaction, and in concentrated solutions a crop of green or greenish-blue crystals make their appearance after a short time.

This subject has been newly investigated by PROFESSOR E. B. STUART, who reports his results in the *Western Druggist* for December, 1888. He has found that the degree of concentration of the antipyrin, or methozin, —the name which he employs for it,—has a marked effect on the intensity of the color, and probably also upon the delicacy of the reaction. The quantity of nitrous acid necessary to produce this reaction is, however, so small that he has not been able to determine its lower limit. He, however, indicates that with a half per cent. alcoholic solution of antipyrin $\frac{1}{80000}$ of nitrous acid will give a strong reaction. The nitrous acid of antipyrin being alleged to possess poisonous properties, it is fortunate that the reaction may be easily pre-

vented by converting the free nitrous acid into a salt through the addition of a base. Sodium or potassium bicarbonate appears to be admissible, and possibly other bases may be used. The acid is not completely neutralized at once by either of these salts, but if they are used in fine powder and vigorously shaken for a moment with the spirit, no color appears on adding antipyrin. Inasmuch as potassic and sodic nitrites are regarded as having the same therapeutic value as the ethyl nitrite, there seems to be no objection to the use of these bases.

ADONIDIN IN THE TREATMENT OF HEART-DISEASE.

There are many things required of a heart tonic. It must so act upon the heart as to improve the contractions of that organ, and in this way relieve any præcordial pain or sense of difficulty of breathing that may be present; it must raise arterial tension if this is too low, and in this way promote the removal of water from the system through the kidneys. And there are two methods by which this arterial tension may be raised. One method is by the drug acting upon the heart itself; its muscular wall, contracting with greater power, sends out blood in larger quantity and with greater force; emptying itself thus more perfectly, the coronary arteries are flushed with larger quantities of blood; the nutrition of the heart is thus better secured, and the nutrition of the tissues is maintained. The other method is for the drug to raise arterial tension indirectly,—so acting, in short, upon the peripheral arteries that they contract, and in this way not only is the blood retained within them, but it tends to be thrown back upon the heart, and we rely upon that organ having still a sufficient amount of energy latent in its walls to respond favorably to the somewhat increased pressure within its ventricles. An effective circulation means functional activity of heart, arteries, and veins. We cannot overlook the claims of the arteries in any therapeutical consideration, for it is they that carry on the work when the heart is in a state of diastole.

The chief danger in heart-disease arises from reduced arterial tension, for the heart itself, no less than the systemic capillaries, then suffers in consequence. If, therefore, this is a danger, our duty is clearly to maintain the blood-pressure; but to do this effectively we must improve as far as we can the movements of the heart as the emitting organ, the arteries as the carriers, and certain nerve-centres as regulating the distribution of the blood.

In the examination of a case of heart-disease, Dr. Thomas Oliver (*Lancet*, November 24, 1888) draws attention to the fact that after determining the nature of the cardiac lesion, the condition of the wall of the left ventricle is of the utmost importance; for the question of greatest importance is as to whether compensation exists, and if so, if it is sufficient; and further, as to the possibility of increasing arterial tension if it be reduced below normal. For all practical purposes, digitalis answers the indications in such a state of affairs; and although an old drug, it is difficult to replace it, simply because its therapeutics are modern and better understood. True, it fails every now and then, and satisfactory results may be obtained by strophanthus or convallaria. It is in mitral regurgitation that the action of digitalis is seen to advantage, although even in many cases of aortic regurgitation, digitalis in many hands has answered remarkably well. When once the actual condition of the left side of the heart is appreciated, and with it that of the right ventricle, the careful administration of any cardiac tonic will seldom be disappointing. Recently Dr. Oliver has employed adonidine, the glucoside of *Adonis vernalis*, as a pure cardiac tonic in cases of aortic and mitral regurgitation.

In all of them great relief was given to præcordial pain, to the apex which ran down the left arm, and to palpitation and dyspnœa. He gives it combined with sal volatile or chloroform-water, in doses of $\frac{1}{8}$ of a grain, four times a day. It is a powerful drug, and is not borne well, particularly at first, in doses larger than this. Frequently, indeed, it may be advisable to commence with $\frac{1}{4}$ of a grain. Dr. Oliver publishes notes of seven cases of heart-disease in which he has given adonidine with the relief of all unpleasant symptoms. Every patient who has taken it expresses himself, after a few days' trial, as feeling generally very much better. The painful throbbing of blood-vessels, headache, and profuse perspirations have, in addition to dyspnœa and præcordial pain, disappeared; and, although there has been in most of the cases a slight increase in the amount of urine, Dr. Oliver thinks that adonidine has but little diuretic action. It is a cardiac tonic, acting chiefly upon the heart, gently raising arterial tension; further, it seems to have something

of the sedative action upon the heart that belladonna has. It relieves the sense of increased intra-cardiac pressure; and the cases of aortic regurgitation in which it appears to answer best are those where the lesion is due either to traumatic rupture of the valve, or to chronic aortitis, and where it has not arisen from rheumatic endocarditis.

CODEINE.

In the *Centralblatt für Nervenheilkunde*, November 20, 1888, Dr. Fischer states that he has for more than five years been employing codeine in all cases where morphine was indicated, and he recommends it as a reliable and much less dangerous remedy, provided a pure specimen may be obtained, a matter, however, of some difficulty. While codeine possesses the narcotic effects of morphine, it is free from the danger of producing the habit; and further, the system does not appear accustomed to its use. Dr. Fischer especially recommends codeine in cases of distressing cough, as in phthisical cases, and in bronchitis, if the secretion is not too excessive, and in all cases of insomnia which are not due to severe pain. In the latter cases he admits it is not comparable to morphine, since the latter reduces suffering more promptly. In many cases, however, where morphine and chloral could not be used, or had failed, codeine exerted prompt hypnotic action. He has employed it in the form of suppositories, and its action was always what was expected, and in no case produced hurtful or disagreeable results. The dose required is considerably larger than that of morphine, about two and a half to three times the dose of codeine being required. A dose of from ⅓ to ½ grain may be given, three or four times in the twenty-four hours, either in powder or in some mixture in which its bitter taste may be disguised. Dr. Fischer protests in the strongest way against the prejudice which seems to be so generally held that codeine is unsafe and an unreliable neurotic.

THE INFLUENCE OF ANTIPYRETICS ON ALBUMEN ELIMINATION.

Dr. Muneo Kumagawa has recently published an elaborate essay on the "Influence of Antipyretics on the Elimination of Albumen," of which the following is an abstract (*London Medical Recorder*, October 20, 1888):

1. *Benzoate of Sodium.*—This salt, administered in non-toxic doses to a dog in a normal state of nourishment, produces an increased elimination of albumen (mean increase, 2 to 5 per cent.; maximum, 19 to 22 per cent.). The action is more marked when the state of nourishment of the animal is poor. Half the absorbed benzoic acid reappears as hippuric acid, the remainder being eliminated without alteration.

2. *Pure Benzoic Acid.*—This acid produces also increased albumen elimination (mean increase, 6 to 8 per cent.; maximum, 17 to 20 per cent.), the only difference between it and the salt being the somewhat more powerful action of the former. Half is eliminated as hippuric acid, the rest is unchanged. The antiseptic action on the alimentary canal is powerful, the amount of combined sulphuric acid in the urine sinking to 20 per cent. of the normal, and the number of bacteria to one-sixth of the normal. The amount of indican in the urine is decreased.

3. *Salicylate of Sodium.*—Administered in non-toxic doses to a well-nourished dog, this produces—(*a*) increased elimination of albumen (mean increase, 10.6 to 13.4 per cent.; maximum, 19.8 to 21.3 per cent.); (*b*) a strongly-increased elimination of uric acid (mean increase, 31 to 45.6 per cent.; maximum, 57 to 74.4 per cent.); (*c*) an increase of the so-called reducing substance (Fleischer) in the urine (mean increase, 60 per cent.; maximum, 77 per cent.); (*d*) an increased elimination of sulphates in the urine (mean increase, 7.2 to 13 7 per cent.; maximum, 18.6 to 25.9 per cent.); (*e*) an increase of the total sulphuric acid in the urine (mean increase, 10.6 to 19.6 per cent.; maximum, 28.5 to 38.9 per cent.). In the period after the administration of the salt there was a corresponding decrease in the elimination of all these substances, which compensated for the previous increase. The relation of the sulphates in the urine to the nitrogen remains constant during that period of the administration in which daily any equal quantity of the albumen taken with the food was oxidized. But when organic albumen besides that of the food is destroyed, the relation becomes much more irregular. Nevertheless, the average elimination of one and the other remains approximately equal. The same is true for the relations of the total sulphuric acid to the nitrogen, and to the total sulphates. During all the periods about two-thirds of the total sulphur compounds are eliminated as sulphuric acid. The antiseptic action of the salicylate of soda on the alimentary canal is not very clearly distinct,

probably on account of its rapid reabsorption. Hippuric acid exerts no influence on the elimination of albumen.

4. *Salol* (Salicylsäure phenyläther).—A great increase in albumen elimination is produced by this drug (mean increase, 19 per cent.; maximum, 41 per cent.). It is poisonous to the dog. Twenty-seven grammes of salol in nine days, given in doses of 3 grammes *per diem*, or .109 gramme *pro* kilogramme of body-weight, killed a dog of 27.5 kilogrammes. This poisonous action on the dog appears to depend upon the salicylic acid separated from it. The antiseptic action of salol on the alimentary canal is not very distinct.

5. *Antifebrin.*—In small doses (2 to 3 grammes *per diem*) this drug produces no obvious alteration in the elimination of albumen in the dog; but, after larger doses (4 to 5 grammes *per diem*) a very considerable increase occurs (mean increase, 30.8 to 35.7 per cent.; maximum, 77.7 to 78.8 per cent.). The increased elimination of forty-six grammes of nitrogen during the administration of antifebrin (corresponding to thirteen hundred and fifty-three grammes of meat or animal tissue) was exactly equalled by the decreased elimination of a similar amount during the twenty-five succeeding days. In forty-nine days of observation, during which very considerable loss of organic albumen and restitution of the same took place, no marked deficiency of nitrogen was observed. In considerable loss of the organic albumen the elimination of sulphates followed irregularly and much later than that of nitrogen, though both substances were derived from the same albumen. The internally administered antifebrin was reabsorbed completely even in large doses from the intestine, and in the course of twenty-four hours almost completely eliminated by the urine. The elimination by the urine occurs sometimes as paramidphenolsulphuric acid. Neither antifebrin nor aniline is appreciable in the urine after the administration of the former. Antifebrin has a powerful antiseptic action upon the contents of the alimentary canal, and also in catarrh of the bladder. The number of bacteria in the former was reduced to one-thirty-seventh of the normal. Large doses of antifebrin produce in the dog no toxic effects save those of great loss of albumen, with corresponding emaciation.

6. *Chinin.*—This drug produces a decreased elimination of albumen. The elimination of nitrogen during the administration of chinin decreased 8.5 to 16.1 per cent., that of uric acid 13 to 50 per cent.

7. *Antipyrin.*—The administration of antipyrin produced in a healthy dog, even in large doses (fifty-one grammes in sixteen days), neither decrease nor increase of the total nitrogenous elimination in the urine; but, on the other hand, a marked increase in the elimination of uric acid (mean increase, 65.2 per cent.; maximum, more than double the normal). The author is uncertain how this can be explained. Large doses of antipyrin were well borne by the dog, quickly absorbed, and as quickly eliminated by the urine.

8. *Thallin Sulfuricum.*—The administration of this salt produced in the healthy dog increased elimination of albumen (mean increase, 6.6 per cent.; maximum, 25.8 per cent.). It was rapidly absorbed and eliminated by the urine as a combined sulphate, even in large doses.

THE TREATMENT OF TUBERCULAR DIARRHŒA BY LACTIC ACID AND IODOFORM.

The effect of lactic acid on the diarrhœa of nursing infants is well known, while its efficacy in the tubercular ulcerations of the tongue and laryngeal disease is generally admitted. It would seem to be indicated on double grounds in the treatment of the rebellious diarrhœa of tubercular cases. HENRI HUCHARD states in the *Revue Gènèrale de Clinique et de Thèrapeutique*, November 22, 1888, that he has for the last six months employed lactic acid in doses of from thirty to sixty grains daily in such cases, but that his results have been almost negative. In such cases he adds that he has frequently arrested the diarrhœa by the use of iodoform in small doses. MM. Sezary and Anne appear, however, to have been more fortunate with the use of the lactic acid, which they have administered in doses of from thirty even up to one hundred and twenty grains daily. It would seem that Huchard's failures are, therefore, attributable to the insufficient quantity administered, for these authors claim that in all cases marked improvement was noticed on the second day, and by the fourth or fifth day the stools had become perfectly normal. They cite in support of this statement nine cases, all of which were cured by this method, and with only one exception did the symptoms return after the cessation of the treatment. It is doubtful whether we can always expect such favor-

able results to be obtained; the diarrhœa is so rebellious, and our means of combating it are so restricted, that any addition to our means of combating this affection must be gladly accepted.

THE ACTION OF CERTAIN DRUGS ON THE UTERO-OVARIAN SYSTEM.

The great majority of females are under the impression that no medicine of any kind should be taken during the continuance of the menstrual flow, and that to take even a mild purgative would be injurious, and many practitioners share in this unfounded prejudice. Dr. Lombe Atthill (*Medical Press and Circular*, December 5, 1888) believes that none of the ordinary remedies taken in moderate doses produce any effect on this function, with the exception of drastic purgatives, which, when taken in large doses, seem to increase the menstrual flow. In considering the action of drugs in cases in which menstruation does not appear at all, or very irregularly, in sufficient quantity, or is unduly profuse, the question arises, Does ergot, savin, quinine, or even strychnine, in medicinal doses, produce any appreciable effect on the muscular fibres? To this question Dr. Atthill appears inclined to give a negative reply. He states that he has employed quinine, strychnine, and ergot, combined with other drugs, and he feels satisfied that these three of the most potent of the so-called emmenagogues have no appreciable effect on the unimpregnated uterus in its normal condition.

With reference to the action of drugs in cases in which menstruation is too profuse, or in which actual uterine hemorrhage occurs, he holds that the medicines known as astringents may at once be discarded, and he believes that the administration of tannin, tannic or gallic acid, or any other astringent, is worse than useless. The mineral acids, according to his experience, are of no great value, and while doses of the tincture of the perchloride of iron have in his hands been of use in checking the flow, it was always in anæmic women, and its beneficial effects were probably attributable to the iron it contains. Ergot is the only drug on which any reliance may be placed. The American fluid extract is, according to him, the only trustworthy preparation; even this drug, however, is most uncertain in its action; in some cases it causes pain, and, when it does, it always lessens uterine hemorrhage, the pain evidently being due to the clonic contraction of the muscular fibres. He further states that it is very doubtful if ergot will originate clonic contractions of the uterus, unless the organ is prepared from some pre-existing cause to expel its contents. In cases of uterine fibroids, ergot will, in general, be found to act most beneficially in arresting the hemorrhage when the tumor is imbedded in the muscular tissue, and that as thinning of the wall takes place, and as the tumor consequently comes in closer contact with the uterine mucous membrane, the result of its administration will be less satisfactory. Permanganate of potassium, much lauded as an emmenagogue, has been extensively employed by him, and always without result.

THE TOXIC PROPERTIES OF BISMUTH.

Drs. Dalché and Villejean publish in the *Bulletin Général de Thérapeutique* for November 15 and 30, 1888, an elaborate experimental essay as to the toxic properties of the subnitrate of bismuth. Their conclusions are as follows:

1. The subnitrate of bismuth is a poison when injected subcutaneously into the animal economy. This toxicity of bismuth, whose molecular weight is 210, is analogous to the properties of other metals with high molecular weight.

2. Taken into the stomach, the subnitrate of bismuth is almost entirely unabsorbed, and is, therefore, not effective; but, when introduced under the skin, the oxide of bismuth becomes soluble when combined with albumen, and the absorption, although slow, is continued, and leads to poisoning.

5. The analogy of bismuth to lead and mercury is not only based upon its chemical relations, but also in the toxic properties and physiological results of its administration. The same symptoms and the same lesions are produced by all, differing only in the degree of intensity. The lesions are widely separated from those met with in chronic poisoning by antimony or arsenic.

OPERATION FOR TORTICOLLIS.

Dr. Levrat has devised a new method of treating torticollis. Instead of operating subcutaneously, he cuts down upon the sternal tendon of the sterno-mastoid muscle, effected by a longitudinal incision two centimetres long.

He clears the tendon with the forceps, passes a grooved director under it, and divides it. He then divides any tissue that may bind down the muscle at that spot, sutures the wound, and dresses it antiseptically with iodoform and gauze. Over the dressings he places the following apparatus. The head being enveloped in cotton-wool, a silicated bandage is wound horizontally around it at the level of the forehead, and a similar bandage vertically over the crown and under the jaw. Where these bandages meet at the level of the mastoid process on the sound side, a small hook, with the concavity looking upward, is inserted. Another silicated bandage is wound round the body below the axillæ, and through the thickness of the bandage a hook is inserted in the middle line in front, having its concavity looking downward. When the bandages have dried, the two hooks are connected by a band of india-rubber, which assists the sterno-mastoid of the sound side to keep up a continuous traction, and so correct the deformity. This apparatus and the dressings are left untouched for fifteen days, and the success of the operation is said to be assured.—*Lancet*, November 24, 1888.

A CASE OF SCIATICA TREATED WITH LARGE DOSES OF ANTIFEBRIN.

Dr. Austin Flint reports in the *New York Medical Record*, December 1, 1888, a case of long-continued sciatica, which, after failure of packing the limb for thirty-six hours in the flowers of sulphur, nerve-stretching, and other remedies, was cured in forty-eight hours by giving antifebrin to the limit of physiological tolerance. The first day fifty grains were given within four hours, and the patient became somewhat cyanotic and weak, but was relieved by a dose of whiskey. The second day forty grains were given in two hours. The third day the pain was completely gone and the patient walked without difficulty.

VIBURNUM TRIFOLIUM IN OBSTETRICAL PRACTICE.

In the *Journal de Médecine* for October 7, 1888, Dr. A. Lutaud adds to the testimony which is rapidly accumulating as to the value of *Viburnum trifolium* in obstetrical cases. In his hands, the author has found viburnum above all a uterine sedative, its use being especially efficacious in preventing abortion and reducing the pains in dysmenorrhœa. In such cases he believes it to be decidedly preferable to opiates, as it is free from the secondary effects of the latter; and it may be given to pregnant women in whom opium is contra-indicated. He refers to the case of a woman in whom the membranes were prematurely ruptured, and in whom the employment of viburnum so delayed the occurrence of labor as to permit the patient to make a railway journey and be delivered at her own home. The author's experience, according to his statement, further warrants him in recommending the employment of viburnum in all forms of dysmenorrhœa, and when the uterine contraction leads to abortion or premature delivery.

EFFECTS OF INJECTION OF SOLUTIONS OF SALT.

According to the Paris correspondent of the *Lancet* for November 17, 1888, MM. Dastre and Loye, in a note in the *Archives de Physiologie*, state that a considerable quantity of a physiological solution of salt may be injected successively into the veins of an animal without causing any apparent trouble, immediate or consecutive. This quantity has been raised by the experimenters beyond two-thirds of the weight of the animal. The expression "toxic dose," the authors remark, has no meaning so far as the salt solution is concerned. There is no such thing as a toxic dose, but there is a toxic rapidity. This rapidity is superior to 3°,—that is to say, the quantity of the solution introduced does not exceed three cubic centimetres per minute and per kilogramme of the animal. In order for the injection to be innocuous certain conditions are necessary,—as moderate rapidity of the injection and the amount introduced, and a healthy state of the organs, especially of the kidney. When these conditions are not fulfilled the animal succumbs sooner or later. There is then observed a constant exudation, which is produced in the serous cavities; also sanguineous suffusions and exudations by the mucous membranes. When the course of the urinary elimination is observed, one notices, as a general rule, a perfect parallelism between this excretion on the one hand and the injection on the other. After a certain time, the quantity injected is balanced by the quantity which is eliminated. This normal regimen reveals the existence of a mechanism which regulates the quantity of water of the organism. This mechanism begins to act when the quantity of salt water

injected is equal to the quantity of the blood of the animal before the experiment. The surplus is immediately rejected. This quantity, equal to the weight of the blood of the animal, seems to separate in two portions: one portion (about twenty-five per cent. of the weight of the blood) remains in the circulatory apparatus during the whole time of the experiment, and is only eliminated definitely later on; a second portion (about seventy-five per cent.) is retained momentarily in the serous membranes and the tissues, to escape equally later on. These facts show a physiological connection between the circulatory and serous systems connected with the preservation of the balance of the watery portion of the blood and of the tissues. Analyses have shown that, when the animal returns to the normal condition, the injection of physiological salt water produced nothing but a "lavage," properly speaking, or a washing of the blood and of the tissues.

THE USE IN THERAPEUTICS OF SOJA.

Under the name of sooju, or soja, as it is designated in Japan, is a liquid obtained by the fermentation of the seeds of the plant belonging to the plant family Papilionaceæ, described for the first time by Koempfer under the indigenous name of *Daidsu*. Linne gives to this plant the name of *Dolichos soja*, while Bentham and Hooker class it as *Glycine*, and this is the opinion which is now generally admitted by botanists. It is, therefore, called *Glycine hispidi* of Siebold and Zuccarini. In the *Bulletin Général de Thérapeutique* for November 30, 1888, M. Egasse publishes a long essay as to the economic and therapeutic uses of soja, with full description of its botanical characteristics. The principal character of the seeds of the soja, from the therapeutic point of view, is the small quantity of starch which they contain, and the large amount of proteids and fats. Although the oil is employed as a food in all parts of China, the seeds are made use of to obtain a milky emulsion, which replaces milk, and which is obtained by crushing the grains and rubbing them up with water, and then filtering through fine cloth. Dr. Egasse believes that a flour from the soja would be of the greatest value in furnishing a concentrated food for convalescents and phthisical patients, while it would be especially valuable in forming the bread of diabetes patients on account of the small amount of starch which it contains.

THE PHYSIOLOGICAL ACTION OF THE NITRATE OF CYTISINE.

In the *Revue Médical de la Suisse Romande* for November 20, 1888, Messrs. Prevost and Binet published experiments made with the nitrate of cytisine which confirms other results already obtained with the extract, with the exception that the pneumogastric nerve is paralyzed by cytisine before the other motor nerves, while it had appeared to resist longer the action of the extract. The extract owes its activity to the cytisine which it contains, and therefore acts in the same manner, although the nitrate of cytisine is from ten to fifteen times more active. His experiments have not conformed with the statements of Kobert and Radziwillowicz as to the similarity of the symptoms produced by this alkaloid and strychnine. The hypodermic injection in small doses leads to the production of vomiting, and in larger doses produces paralysis of the motor nerves, analogous to that produced by curare. Death is produced in mammals by asphyxia, preceded by fibrillary contraction of the muscles; sometimes by clonic convulsions. Intravenous injection produces rapid and considerable increase of arterial pressure, although it is of short duration and is absent when the cytisine has been injected under the skin or in the peritoneum. This fact will explain the absence of the increase of blood-pressure in the experiments made with the extract, since the latter preparation could not be injected directly into the veins.

VERY HOT COMPRESSES IN SURGICAL PRACTICE.

Professor I. I. Nasiloff, writing in the *Vrach*, gives an account of several cases of inflammation of the lymphatic glands which he treated with marked success by means of very hot compresses. These compresses consisted of a fourfold piece of linen, rather larger than the surface over the affected glands. It was dipped into water at a temperature nearly or quite equal to 212° F., wrung out, and applied quickly over the glands, its own temperature being then from 140° to 165° F. These applications were made morning and evening, the compress being allowed to remain on, covered over with cotton-wool, for about fifteen minutes. As may be supposed, the application produced somewhat severe pain, but this did not last long, though sometimes not only redness,

but a blister, was caused. The treatment was continued for about a fortnight. It was found that it very soon began to promote absorption; this action was always accompanied by a rise of temperature, depending apparently upon the size of the diseased glands, and upon the extent to which absorption was taking place. It was noticed that the earlier the treatment was adopted the more effective it showed itself. Professor Nasiloff believes that hot compresses are a valuable form of treatment, not only in strumous glands, but in rheumatic osteo-myelitis and in fungoid inflammation of the joints.—*Lancet*, December 1, 1888.

BRYONIA ALBA AS AN ANTIHEMORRHAGIC.

The bryonia alba, whose characteristics are distinct from the bryonia dioica, produce, when administered to animals, contraction of the capillary vessels, which may be so complete as to lead to the direct arrest of the circulation. PROFESSOR PETRESCO states in the *Revue Internationale des Sciences Médicales* that he has employed preparations of this drug in cases of hemorrhages occurring from different sources; especially in post-puerperal metrorrhagia he has obtained the best results, using ordinarily 20, 25, or 30 parts of the dry root to 3000 parts of water. M. Urbeano has analyzed this root, and has found in it several resinous principles and a glycoside, the latter being the most energetic of the active principles. Petresco suggests the name *breine* for the glycoside, from the name *brei*, the popular designation of the bryonia alba in Roumania. The author further states that 3 grains of the glycoside in 16 minims of water in the case of rabbits, or 1½ grains in the case of the frog, will produce marked vascular contractions. He believes that his result warranted him in concluding bryonia alba to be among the best antihemorrhagic remedies.

THE TREATMENT OF THE ACUTE STAGE OF TRAUMATIC TETANUS.

At the meeting of the New York Academy of Medicine, held December 18, 1888, DR. J. C. MINOR read a paper on the "Treatment of the Acute Stage of Traumatic Tetanus" (*Medical News*, December 29, 1888). This, he said, was a study in toxicology, a question of poisons and antidotes, since he assumed at the outset that the disease itself was the manifestation of a poison due to the tetanus germ, and produced by the formation of ptomaïnes as a sequence of its germ origin. The discoveries of Nicolaier, in 1884, and the subsequent investigations of Carle, Ratione, Rosenbach, Terari, Hocksinger, Shakespeare, and Brieger, had demonstrated that tetanus was a blood disease, infectious, inoculable, and having its origin in a bacillus, and that from germ cultures at least three poisonous substances or alkaloids could be separated,—viz., *tetanine*, which produces tetanus; *tetanotoxine*, which gives rise to tremors, paralysis, and convulsions; and *spasmotoxine*, which gives rise to tonic and clonic spasms. These facts bearing upon the modern aspect of the etiology and pathology of the disease, served to substantiate the observation that in the treatment of tetanus we had to deal with a toxic condition. As to the prevention of the disease, the fact that a high temperature destroys the tetanus germ pointed to a possible local prophylaxis in the primary dressing of wounds.

The healthy working of a nervous centre, as has been well said, required two equally necessary qualities,—namely, a power to act when called into play, and a power of remaining at rest. In tetanus the latter was lost, inaction becoming impossible because excitation was constant. Even when the tonic contractions diminished in force nervous energy accumulated during the remission, to be discharged later on as a paroxysm of increased tension or spasm. The disease has a duration, in average cases, of three or four weeks. There seemed to be a definite limit to the production of toxic material, and the disease, having run its course, terminated in recovery, under certain conditions. That these conditions are not often fulfilled was shown by the mortality, which Gowers placed at nearly ninety per cent., a rate that was a sufficient warrant for better and more systematic methods of treatment. The fact that the disease was self-limited should encourage the hope of a successful treatment, provided the patient could be protected against its force for a definite period, and the mortality lists show that this definite period consisted of the first and second weeks of the disease, the acute stage of tetanus. Recovery, therefore, depended mainly upon the treatment during this time.

It was admitted that we could neither eliminate nor destroy the poison of tetanus, and that the disease, once started, was beyond the reach of direct methods of antagonism. But when we consider the limitation of the

disease and the fact that its activity was expended upon the cord and medulla, we were led to the inference that if we could so act upon the central nervous system that the force of the disease would be spent upon a benumbed tissue, if we could so modify the functions of the cord as to diminish materially its reflex excitability until the nerve-storm has passed, we should accomplish the most essential end of treatment. The problem before us, therefore, was how to put the cord and medulla "in splints," physiologically, to do this in the shortest possible time, and to maintain this condition of modified function for at least two weeks.

Dr. Minor did not believe it possible, except by profound anæsthesia, to obtain complete relaxation of all muscles in the first period of an acute case of tetanus without incurring as much danger from the remedies used as from the disease. The object of treatment was not to abolish the manifestations of the disease, but to control them to such a degree as to maintain a relatively safe condition long enough for the disease to expend itself. The effect of the disease upon the muscular system was the main point of clinical significance.

Beginning with mere stiffness of the jaws and neck, the muscular tension increased, and subsequently involved the muscles of the abdomen and chest. At times a sudden increase in the degree of this tension occurred as a paroxysm or convulsive spasm affecting the whole muscular system, producing opisthotonos or other distortions, and threatening death by asphyxia from tonic contraction of the muscles of inspiration. It was to be noted that one had a period of remission and one of exacerbation, with a certain rhythmic rise and fall of nervous excitability. This condition, during the first or acute stage of the disease, was one of increasing violence,—the spasms growing more severe, and the remissions shorter or less pronounced, until, in from one to two weeks, the disease culminated in a spasm of extreme violence that usually ended the case. The termination was not always fatal, however, as this might be the critical discharge, from which the patient, if he survived, would pass at once into the declining stage of the disease. Other causes of death might occur in the form of simple exhaustion, cardiac failure, or accidental complications.

It appeared, then, that if one could eliminate these convulsive paroxysms from the disease it would cease to yield such a frightful mortality, and the aim of our treatment, consequently, should be to prolong the remissions, and modify or absolutely prevent the paroxysms. Now, it was a well-known fact that when the functions of the nervous system were under the control of any agent that modifies them, they were not easily affected by any other agent; and in tetanus we had a toxæmia, of which *tetanine* was the genetic agent. This poison produced a marked influence on the functions of the cord, increasing its reflex excitability, and if we attempted to counteract this effect by agents that depress the functional activity of the cord, we should find that ordinary doses produced little or no effect, because the nervous system was already under the control of a powerful modifier of function. Hence toxic doses would be required to produce therapeutic effects. On the other hand, if we once obtained control of the nervous system, and maintained that advantage, by using our remedies in doses sufficient for the purpose, neither *tetanine* nor any other agent would easily regain control of the functions thus modified.

Assuming that all remedies useful in the treatment of tetanus must possess the power of depressing the functional activity of the cord, the choice of remedies was not of more importance than the method of using them; and a poor remedy well used was better than the best of remedies inefficiently given. The main object being to intoxicate the spinal cord, so as to depress its normal excitability, it was evident that quite a wide range of drugs was at our service. The ones to which Dr. Minor gave the preference were Calabar bean, chloral, and the bromides, with an occasional resort to chloroform. Each of these remedies, he said, appeared to have a special place and purpose in clinical use. Chloroform, Calabar bean, and chloral were the most efficient in the first period of the disease and at its crisis or climax; while the bromides, and also the salicylates, come into use during the declining stage.

In the first stage there are three indications to be fulfilled: (1) to lessen muscular rigidity; (2) to prevent convulsive spasms; and (3) to carry the patient through the crisis. The three remedies mentioned are not equally adapted to the purpose in view. Chloroform, for instance, had only a limited use; but within its range of adaptation its action was unrivalled. It was to be employed in those cases of rapid development, occurring soon after an injury, in which the violence and

frequent recurrence of the paroxysms threatened an early and fatal termination. Again it might be necessary in cases of slower development, in which the disease, either from neglect or inefficient treatment, had been permitted to get under full headway. Under these conditions chloroform was of immense value. Its action was sure and rapid, and carried to the degree of narcosis it gave us complete control of the functions of the cord, abolished reflex excitability, and held the disease in check. This point attained, anæsthesia was to be continued long enough to transfer the control of the functions of the cord to some other and safe agent. During anæsthesia, then, we might administer chloral, Calabar bean, or any remedy suitable for hypodermic or rectal use, and, after waiting twenty or thirty minutes for absorption to occur, suspend the chloroform.

Of the two agents mentioned, Calabar bean was preferable, because its action was confined to the same field in which the tetanus poison operated, and it was the nearest approach to a physiological antidote to *tetanine* that was at our command. The variable character of the drug, as usually found, rendered it very unreliable in practice, however, and it was better to use the salicylate of eserine than to depend upon the solid extract of Calabar bean. Chloral was not so good a remedy, or so perfect an antagonist of tetanine, but it was a better drug, and practically of greater service. If Calabar bean was used, chloral would be needed to supplement its action as the disease approached its climax; while if chloral was used, the bromides would serve in the same relation. As to dosage, we should start with the maximum quantity, and be governed as to its subsequent increase by the effect observed upon the muscles. Verneuil advised doses of not less than 1 drachm of chloral to adults, and not less than four drachms daily. He considered it necessary to keep the patient in a kind of continuous coma for at least fifteen days, and then gradually to reduce the amount of chloral daily. It, of course, had its dangers, as well as its advantages, and there was, in fact, no such thing as a perfectly safe method of treating the disease successfully. Twice, Dr. Minor said, he had succeeded in carrying cases to recovery with much smaller doses of chloral than those mentioned. He believed that a semicoma was not the best condition for the tetanine patient, and that smaller doses were equally effective if combined with or supported by the action of other remedies. If about the end of the first week the bromides were superadded to the chloral, we should increase the action of the remedy without adding to the danger of its use.

The use of Calabar bean required far more care and attention to detail than the chloral treatment, and he recommended that the initial dose should not be less than half a grain, if the solid extract was used, the question of repeating this amount or not being determined by the effect produced. The object was to regulate the doses in such a way as to anticipate the condition of muscular tension, and thus prevent the occurrence of spasms. Under the use of Calabar bean the periodicity naturally incident to the disease became more marked, because the remedy contributed to a more pronounced remission during its action. Two grains of the solid extract might be sufficient to obtain this relief for two hours at a time, during the first week of the disease, but three or four grains were usually necessary before the end of the second week; and the increasing violence of the disease would bring these doses closer together. As the crisis approached, the patient was in great danger from both the disease and the remedy, as both were cumulative in their toxic action; and at this stage both these dangers would be materially lessened by bringing chloral into use, and rapidly diminishing the amount of Calabar bean.

During the period of increase of the disease, no matter what remedy was given, it was necessary to increase the dose in proportion to the work it had to do, and when the crisis came we had to choose between the danger of an excessive dose of our remedy and an excessive dose of *tetanine*. We chose the first, because if toxic symptoms appeared we might antidote them, with the probability that the disease had spent its force at this point. To pass this crisis successfully signified recovery.

Having referred to the toxic symptoms of Calabar bean, and their treatment by atropine and morphine, Dr. Minor said, in conclusion, that to use our remedies timidly was to permit the disease to kill the patient. To use them recklessly was to perform that office ourselves. The impossibilities assumed by the physician in the treatment of traumatic tetanus were precisely the same as those belonging to the surgeon who conducted a dangerous and difficult capital operation. As to the general management of these cases, rest and nourishment were so important in their relation to the successful issue of treatment that,

no matter how careful and thorough the therapeutic methods might be, they would certainly fail unless the strength of the patient was properly supported, and his nervous system protected against undue excitement.

SULPHO-PHENIC ACID AS A DISINFECTANT.

DR. LAPLACE (*Journal de Médecine de Paris*, November 4, 1888) has employed sulpho-phenic acid in the Hygienic Institute of Berlin, and he regards it as an excellent disinfectant. It is prepared by heating for a short time a mixture of twenty-five per cent. of sulpho-phenic acid and the ordinary sulphuric acid, and then letting the mixture cool. The liquid so obtained is readily soluble in water, while the ordinary phenic acid is only partly soluble in this vehicle. The examinations have shown that the microbes of malignant pustule are destroyed, after remaining for forty-eight hours, in a four per cent. solution, and, after seventy-two hours, in a two per cent. solution. The same result is attainable by a two per cent. solution of phenic acid and creolin. Corrosive sublimate alone possesses more energetic action; but it, however, possesses the disadvantage of being dangerous and much more costly.

SALOL IN THE DISEASES OF CHILDREN.

According to the Paris correspondent of the *British Medical Journal* for December 22, 1888, M. DEMME has recently published his experience with the use of salol in diseases in children. He has used it in four cases of articular rheumatism, two of acute endocarditis, two of vesical catarrh, and also as an external application in two cases of burn. Two of the patients, aged 8 and 13, were suffering from acute rheumatic polyarthritis. Two and a half grammes of salol were administered in twenty-four hours, in doses of .75 centigramme (12 grains). The doses were continued during five days in one case and seven days in the other. When the temperature fell, the daily dose was reduced to one and a half grammes. The effects of the salol were not rapid, but there was no relapse, and the affection only lasted from fifteen to sixteen days. Three grammes and three-quarters of salol were administered at intervals to a little girl of 7, suffering from rheumatism. The temperature fell from 39.8° C. (102.9° F.) to 37.2° C. (98.8° F.) in forty-eight hours, and the pain and swelling in the feet, right knee, and left elbow were considerably diminished. In the case of another little patient of 9, the results were not so favorable. A dose of .75 centigramme, administered as an emollient or in a lozenge, caused vomiting in from ten to fifteen minutes. A double dose, administered in the yolk of an egg, produced general urticaria in eight or ten hours, without having any effect on the fever or the state of the articulations. Salicylate of soda was substituted, and some improvement followed, but the eruption returned. The patient recovered eight days afterwards, but had a relapse. 3.75 grammes of antipyrin were then administered for four days, at the end of which the patient was completely cured. In endocarditis, salol gave good results if the action of the pulse was modified by digitalin. In a case of cystitis caused by cantharides, salol also proved beneficial. Daily doses of one gramme to one and a half soothed the pain, increased diuresis, and caused the alkaline reaction and the muco-pus in the urine to disappear. Towards the end of the treatment the urine assumed a greenish-brown hue, resembling that produced by carbolic acid.

STERILIZED MILK.

From a correspondence in the pages of the *St. Petersburger Medicinische Wochenschrift*, we learn that the practice of sterilizing milk is extensively carried out in the Russian capital, not only in the Children's Hospital and some of the larger dairies, but in many private families. Though but recently suggested by the German chemist Soxhlet, whose name is familiar to all analysts through his ingenious apparatus for the extraction of fats, the process is nothing more or less than the common one of sterilizing fluids in flasks by heating them in a water-bath to boiling and hermetically closing their mouths while their contents are in a state of ebullition. There has been much discussion both in the papers and in the medical society as to the respective advantages of the flasks advocated by Dr. Grābner and the ordinary bottles which Dr. Martenson has adopted after a trial of several special forms. Bottles, he very reasonably urges, are always at hand; they are less easily upset, and less fragile than the flasks commonly used in laboratories, while flasks of thicker glass are as liable to break if the heat be applied too quickly. The best method of closing the flasks or bottles has

also been a matter of debate; Dr. Westphalen, of the Children's Hospital, rejects india-rubber stoppers as unnecessary, and Dr. Martenson agrees with him; but corks are certainly hard to maintain in an aseptic condition. We should be inclined to recommend the new patent spring stopper which has recently been largely employed by wholesale druggists as perfectly air-tight and cleanly, and at the same time more easily removed than glass stoppers, which are apt to be firmly retained by atmospheric pressure over a partial vacuum. For the rest, a water-bath, with suitable arrangements for heating and a rack or frame for keeping the bottles in position, are all that are required. In the presence of foot-and-mouth disease, which, as Johne has shown, may be communicated as such to man, and has led, more often perhaps than is known, to epidemics, as it were, of low and even fatal pneumonia, with herpetic or eczematous eruptions among infants, and indeed in all cases in which the milk is not above suspicion, simple boiling is all that is required to exclude the chance of infection; but in the closure of the bottles while boiling, the subsequent access of aerial germs is prevented, and the milk remains perfectly fresh and unaltered for two or three weeks. Such sterilized milk might be supplied by the dairy companies in pint, quart, or gallon bottles with spring stoppers for use in nurseries, and on board passenger steamships and yachts, where it would be preferred to condensed milk by most persons.—*British Medical Journal*, December 8, 1888.

PARALYSIS AFTER PNEUMONIA.

Dr. B. H. Stephan mentions in the *Weekblad* twenty-five cases of pneumonia which came under his observation, in which he thinks two points are of special importance. The first is the high death-rate, nine out of twenty-five patients, or thirty-six per cent., dying; the second point is the adynamic or asthenic character of the pneumonia, in which the brain symptoms predominated and the pulmonary affections were secondary. Dr. Stephan thinks that these considerations, and the complications of a typhoid or bilious nature which may arise, point to the conclusion that pneumonia, under certain aspects, must be regarded as "specific fever." He believes that adynamic pneumonia is more frequent now than formerly, which leads him to the conclusion either that the constitution of individuals predisposed to pneumonia must have altered, or that the causes of pneumonia itself are changed. Dr. Stephan considers it not improbable that the first hypothesis may be correct,—namely, that the frequency of neurasthenia in the present day shows the weakening of the cerebro-spinal system. A surgeon told Dr. Stephan he had practised blood-letting with the most successful results for thirty years at Drenthe, but that of late, in Holland, he had become very shy of doing so in inflammatory affections of the chest. The question suggests itself whether former practitioners acted wrongly in their treatment of pneumonia, or whether the physical condition of patients is now altered. Out of the twenty-two adult patients treated by Dr. Stephan, twenty were men exposed to very decided changes of temperature. The fact is undoubted that more men than women are attacked, and Dr. Stephan considers it very probable that chills and infection are directly connected. The theory that bacteria are a cause of pneumonia appeared to him a plausible explanation. If the pneumococci are only waiting an opportunity to attack us, then the hypothesis that a lesion in the lung is favorable to their development is intelligible. What may happen in the case of traumatism may happen in the case of a chill. In a healthy condition the body is entered by countless bacteria, which are kept in check by the normal resisting power of the healthy tissues, but as soon as the normal equilibrium is upset, one or other of the organs is attacked and becomes the sport of these bacteria. Dr. Stephan mentions two cases of paralysis ushering in the pneumonia; the first was a man, who was suddenly attacked with apoplectic symptoms. In two days the whole of his right lung was solid with pneumonia; the pneumonia ran a regular course, but the paralysis of the arm, leg, and facial muscles did not disappear completely for three months. In the other case, a child of 2 years, the pneumonia was preceded a few hours by strong convulsions, after which symptoms of meningitis became well marked; the lung-disease followed, and the child died on the eleventh day. In conclusion, Dr. Stephan remarks that paralysis has sometimes occurred at the commencement, during the course, or at the end of an attack of pneumonia; and where there has been a necropsy either meningeal symptoms have been found or else there were no macroscopic or microscopic lesions. The most probable explanation of the first category is that the pathological anatomical lesions rest

on the extra-pulmonary localization of the pneumonia poison. In the second, the explanation probably is that the pneumonia poison, either directly or through the medium of the blood-vessels, occasions dynamic disturbances in the nerve-centres or nerve-trunks. —*British Medical Journal*, December 15, 1888.

THE ANTI-HYDRORRHŒIC PRINCIPLE OF THE WHITE AGARIC.

Since the end of the last century the white agaric has been employed in medicine for combating pathological sweating, especially in tubercular patients. In 1882, Dr. J. M. Young proposed to substitute for agaric, agaricine, a much more active substance extracted from mushrooms. It has been recognized, however, that agaricine of commerce is not a simple substance, but is a mixture in variable proportions of at least two bodies; the one is agaric acid, which has been isolated in a crystalline state and analyzed by M. Fleury. According to the researches of M. HOFMEISTER, it is to this agaric acid that the white agaric owes its anti-hydrorrhœic properties.

The works of Jahn have shown that agaric acid is a homologue of muriatic acid, and that it has for its formula $C_{14}H_{27}(OH),(CO_3,H_3)$. It is but little soluble in cold water, while much more soluble in boiling water. Its neutral alkaline salts are soluble in water, while its other saline combinations are insoluble. To study the physiological effects of this substance, M. Hofmeister has used the agarcinate of sodium both in subcutaneous injections and the agaric acid administered by the mouth; while not a violent poison, agaric acid is by no means an indifferent substance. A subcutaneous injection of 16 minims in a three to five per cent. solution gives marked pain, followed by local inflammation. The administration of from 7½ to 15 grains of agaric acid by the mouth produces diarrhœa and vomiting. In cold-blooded animals the general effects of agaric acid consist of an increased paralysis of the nerve-centres with reduction of the cardiac activity, and diminution of the cutaneous secretion. In warm-blooded animals it is necessary to inject under the skin or into the vessels at least 1½ minims of agaric acid per kilogramme of body weight to obtain the physiological effects, which consist in the rabbit in somnolence, prostration, and slowing of the respiration. In toxic doses to animals suffering from dyspnœic spasm of the respiratory muscles, a convulsive contraction of the limbs results, while sometimes general convulsions precede death. On the circulation agaric acid leads to considerable reduction of the blood-pressure when administered in small doses, but to a slight increase over the normal pressure when given in larger doses, thus showing that agaric acid appears to act on the vaso-motor centres and on the pneumogastric nerve. In order to study the influence of this body on the secreting of perspiration M. Hofmeister (*Gazette Médical de Paris*, November 17, 1888) experiments on cats. His results showed that agaric acid possesses in a similar manner to atropine, though in a less degree, the properties of reducing perspiration. It does not produce mydriasis when instilled into the conjunctiva. The author also attempted to determine whether other acids chemically analogous to agaric acid possess likewise this action, but so far his experiments have given a negative result. The author concludes from his research that it is necessary to avoid the use of agaric acid or its salts in subcutaneous manner, on account of the painful reaction which this method occasions. When, however, it is given in doses of from ⅓ to ½ grain, they are well supported by phthisical patients; while a dose of 1½ grains produces no unfavorable symptoms, with the exception of transient nausea.

REMARKABLE EFFECT OF IODIDE OF POTASSIUM IN A CASE OF AORTIC ANEURISM.

The following is an abstract from a report in *Gyógyászat*, by DR. BERÉNYI, of Gran. An official, aged 54 years, had a sudden attack of hoarseness. A specialist pronounced the cause to be rheumatic paralysis of the left vocal chord, but electric treatment, lasting six weeks, had no effect. In fact, the nightly attacks of suffocation grew worse, and swallowing became very difficult. Another doctor recognized the disease as aortic aneurism. When the patient came to Berényi, after two months of unsuccessful symptomatic treatment, he was greatly emaciated, and had a moderate œdema on the knuckles. In the sternal region, corresponding with the second and third left ribs, there was a dull percussion sound, and in the fossa jugularis active pulsation. The heart-sounds were clear. Following the recommendation of English authors, Dr. Berényi gave daily 1.80 grammes (about thirty grains) of potassium iodide. The improvement during the following months was

striking; the asthmatic attacks disappeared, as well as the difficulty in swallowing, while the hoarseness grew less, and the dulness decreased. At the same time the patient increased in weight. Berényi intended to continue the medicine as long as the system tolerated it. After one hundred and seventy grammes had been given there were yet no indications of iodism.—*London Medical Recorder*, December 20, 1888.

THE TREATMENT OF GOITRE BY INTRA-PARENCHYMATOUS INJECTIONS OF IODOFORMED ETHER.

Some time ago M. Mosetig von Moorhof highly recommended the injections of the ethereal solution of iodoform in the treatment of goitrous tumors. Dr. Felix Terrier publishes a note in *Le Progrès Médical* for December 1, 1888, which is a further confirmation of the value of this treatment. The treatment was undertaken in a young man of robust health, 17 years of age, in whom the goitre consisted of three tumors. The most voluminous was situated at the right side of the neck, and was the size of at least a hen's egg; the smallest, about the size of a hazel-nut, in front of the trachea, and the other, in volume between these two, was situated on the left side. The tumors were very hard, but not adherent to the skin, and were movable during deglutition. Treatment was commenced by the injection of a five per cent. solution of iodoformed ether by means of a hypodermic syringe, one injection being made each day. At the end of three weeks, the neck had diminished about an inch in circumference. The subsequent treatment was as follows: From the 11th of March to the 29th of May, one injection was made every two days; from the 1st of June to the 31st of July, one injection was made every three days; from the 4th of August to the 5th of September, two injections were made each week; from the 10th of September to the 4th of November, one injection was made each week, or, in all, one hundred injections were made. At the time of writing, Dr. Terrier states that the goitre was not quite completely cured, but that there only remained a small, hard lump about the size of a small nut in the place of the large tumor which had been originally there. The other tumors had entirely disappeared, not even the slightest particle remaining. Injections of iodoformed ether into the little nodule which then remained will cause it also probably to completely disappear.

MYRTOL AS A DISINFECTANT OF THE AIR-PASSAGES.

The problem how to disinfect the air-passages is not yet solved. Skoda's turpentine inhalations are not always tolerated, and require a long use. Masks and similar apparatus (Curschmann and others) are also much objected to by patients. Professor Eichhorst is of opinion that myrtol will leave all other disinfectants in the background in security and quickness of action. Myrtol is represented by that part of myrtol oil which comes over between 160° and 170°. It is a clear fluid of aromatic and penetrating smell, which can be conveniently administered in gelatin capsules. French authors have recommended it in bronchial catarrh, and scattered observations have been made on its disinfecting properties. But a methodical use of this substance has not been made, and it is not mentioned in various recent works on therapeutics. After only one gelatine capsule, the breath smells of myrtol within an hour, and the effect lasts from twenty-four to forty-eight hours; but, in order to subdue putrid processes, two capsules (each containing .15 gramme) were usually given every two hours. The appetite improves under its use, and the expectoration and breath lose all offensive odor with remarkable quickness. Four cases are mentioned by Professor Eichhorst as showing the beneficial action of myrtol in a striking degree, but one of the cases showed that it possesses no specific action against the tubercle-bacillus. The expectoration diminishes under its use; the appetite, as before remarked, improves, and the patients feel better generally.—*London Medical Recorder*, December 20, 1888.

MOUSSENA—A NEW TÆNICIDE.

M. Thiel has discovered in the bark of a leguminous plant, described by Baillon under the name of *Acacia anthelmintica*, a substance whose chemical characteristics closely resemble those of saponine (Moussenine). The author states that this bark is much more active as a tænicide than kousso, and is less disagreeable to the taste. He has employed it in the form of a powder in a dose of from 10 to 16 drachms, mixed with honey or milk; or it may be employed in infusion, of which

an ounce may be taken as a dose, given in the morning two or three hours before eating. In the evening of the same day, or in the morning or evening of the day following the tænicide, the parasite will usually be displaced, followed, after a few days, with removal of their fragments.—*Journal de Médecine de Paris*, November 11, 1888.

Reviews.

THE PHYSICIANS' LEISURE LIBRARY, No. 7. THE MODERN TREATMENT OF PLEURISY AND PNEUMONIA. By G. M. Garland, M.D., etc.
Detroit, Mich.: Geo. S. Davis, 1888.

The cover shows the title, whose pregnant words we have given; the title-page omits the word "modern." The former is more modest, the latter far more decided and ambitious. For what is the modern treatment of any disease? who follow it? who know it? who are the ancients, and what is the ancient treatment? are we ourselves ancient or modern, progressive, or buried in dead theories and conceits? Judged by the standard of the treatment of pleurisy and pneumonia, as set forth by Dr. Garland, how few practitioners are yet "modern." For between modern therapeutics —*i.e.* the therapeutics of to-day —and ancient therapeutics—*i.e.*, those of last Wednesday—there exists an awful gulf, across which the saved and exalted call with derisive voices to their whilom brothers, and flaunt cooling drugs, which would solace them, by reducing their temperature, could they only reach and grasp them. The ancient treatment of pneumonia, Dr. Garland tells us, has varied with fashion. He divides it into six categories,—viz., depletive, supportive, expectant, antipyretic, antiseptic, symptomatic. All these methods he discusses more or less briefly, spending some time on the antipyretic and its statistics. But one of the six receives any commendation,—the supportive, which, combined with the symptomatic method, "forms the only satisfactory treatment thus far devised." Early in the disease the author sees no objection to the use of opium in full doses, and thinks it certainly "a wise and humane proceeding," and one which "can produce nothing but benefit to the patient." Later in the disease he admits the danger of its use. "For many years the poultice has been held in reverent esteem," but no statistics exist to prove that it has value, and, "unless properly applied, poultices are a cold, clammy, heavy, burdensome incubus to the patient." We should have called them "incubi," but it is of no consequence. They do not shorten the disease, but they may alleviate pain; this they do in direct proportion to their heat. But, since heat is the valuable agent, the author recommends, as much cleaner, lighter, and safer, a rubber coil filled with heated water. For sleeplessness Dr. Garland has no sure remedy. Bromides and ice-bags to the head might be tried. In delirium, alcohol and morphine for known alcoholics; carbonate of ammonium, tonic doses of quinine, 2 or 3 grs. a day, and liquid food. "Strophanthus promises to be a better heart tonic for pneumonia than digitalis, because it is more sedative to the nerve-centres." In sudden collapse, brandy and ammonia hypodermically and heat locally. In the collapsed condition sometimes met with in the regular defervescence, with enfeebled heart, Phillips's suggestion of phosphorus, in $\frac{1}{200}$ gr. doses, is approved, or strychnine and strophanthin combined. "The majority of cases do not need alcohol." Calomel the author uses as a laxative in the early stages, and gives "all the water and ice which the patient desires." When the air-passages become dry, generate steam near the patient. We have given the author's treatment of pneumonia almost in full, but the treatment is by no means the best part of the book. The management of pleurisy, as detailed by him, will probably give some very new and valuable ideas on the subject to many readers.

E. W. W.

PRACTICAL LESSONS IN NURSING. FEVER NURSING, DESIGNED FOR THE USE OF PROFESSIONAL AND OTHER NURSES, AND ESPECIALLY AS A TEXT-BOOK FOR NURSES IN TRAINING. By J. C. Wilson, A.M., M.D., etc.
Philadelphia: J. B. Lippincott Company, 1888.

This is quite a complete book on the subject, and contains all the information concerning the duties of a nurse that is necessary or desirable. The various duties are clearly stated,—the various methods of doing what has to be done,—watching of symptoms, keeping records, and, in short, the numberless items which make up a nurse's life and work. But we cannot help thinking that the author has dealt out his learning with a far too lavish hand, and that a mastery of his work will tend to create a class of semi-practitioners, who will lose the virtues of the nurse and acquire only the vices that beset the lower grade of practitioners. Perhaps no

one fault can be found with a nurse which is worse than a disposition to criticise the management of a case, and even to attempt its management herself. Yet the author seems almost to invite such a state of mind. Then, too, there is often to be found a use of technical terms, which is unnecessary. How much better a nurse will she be who learns that in scarlet fever as the eruption fades "the temperature falls by lysis," or who starts out with the fixed idea that "the treatment of scarlet fever is, in the mild cases, expectant; in the severe, symptomatic;" even though she is also told that "many physicians employ specific medication."

Again, all physicians may not agree that "the patient's mouth, nose, and throat should from the commencement of the illness, even in mild cases, be systematically and frequently cleansed by spraying with Dobell's solution, Lystrum's, Labarraque's, in proper dilution, or with other suitable antiseptic fluids, as the doctor may prescribe," or that "the swelling of the glands of the neck must be treated at first with salves," "then with ice or poultices." The doctor who does not believe in cold baths or cold effusions will be hampered by a nurse who is told that they should be used, and the sentence, "if inflammation of the kidneys occur it requires prompt and energetic treatment," should, we fancy, be addressed rather to the medical attendant. In short, while the book is exceedingly good and sound in almost every respect, we cannot but consider it unnecessary to attempt to educate the nurse in so many of the duties of the practitioner. Nursing is one thing, and has its responsibilities. Treatment is quite another, and its responsibilities lie upon a different pair of shoulders, and the nurses who thoroughly rely upon the practical lessons here given will be very likely to aspire to the more ambitious position of practitioners of medicine. E. W. W.

THE MALE URETHRA: ITS DISEASES AND REFLEXES. By Fessenden N. Otis, M.D., etc.
Detroit, Mich.: Geo. S. Davis, 1888.

The object of Dr. Otis in this little book is to still further confirm the value of the division of strictures of large calibre, when such strictures can be detected in persons suffering from various diseases of the genito-urinary organs and from various reflex disturbances of greater or less severity. The cases given, which are many, seem to strikingly confirm the author's belief, but one must eliminate here as elsewhere the curative or palliative influence which any operation, properly or totally uncalled for, has in a vast majority of nervous diseases and reflexes. In no other way can the multitudinous cures occurring after many modern operations be accounted for, especially when we find many of these cures relapsing, only to be cured by still more radical operations.

The volume also contains Dr. Otis's ideas upon the treatment of urethral discharges. Specifics he avoids, in accordance with the best modern opinion. He believes in deep urethral irrigation with hot water, as advocated by Dr. Holbrook Curtis, of New York. The medicated injections devised by Dr. Curtis in some cases give rise to prostatitis; but better than all, in the opinion of the author, is an injection of bichloride of mercury, 1 in 40,000 for acute, to 10,000 in chronic cases, given with Kiefer's two-way tube, and using from one to two quarts of the solution at ordinary temperature. This method, suggested by Dr. Halstead, of New York, has met with varied success, many discarding it after a short trial as worthless, others meeting with excellent results. Dr. Otis indirectly reveals both the strength and weakness of the treatment, though without comment,—viz., the fact that in from six to ten days the discharge will generally, in fact, almost always, become thin, serous, and without color, but will persist in this state for an indefinite period; or, if it be entirely checked, will relapse into the serous discharge again in twelve to twenty-four hours after the injection is suspended. Dr. Otis very wisely, under these circumstances, advises, when the discharge becomes thin and painless, "a saturated solution of boric acid or potass. permanganate, gr. $\frac{1}{8}$ to gr. $\frac{1}{4}$ to the ounce, or alum and carbolic acid, till the cure is complete." E. W. W.

THE LIFE INSURANCE EXAMINER. A PRACTICAL TREATISE UPON MEDICAL EXAMINATIONS FOR LIFE INSURANCE. By Chas. F. Stillmann, M.S., M.D., etc.
New York: The Spectator Company, 1888.

The business of life insurance is now so extensive and far-reaching that the work before us appeals to a very large number of practitioners, in the country as well as the city. In small towns and villages the medical man of local reputation is liable to be called upon at any time to make examinations at the request of the ubiquitous "agent." A good guide to the subject has been long wanted, and we think Dr. Stillman's work a very thorough and valuable one. How many

doubtful points he clears up, how much good and much-needed advice he gives, can be best judged by the reader who is familiar with the occasional perplexity of the situation. We are unwilling to join in the sweeping accusation of incompetence recently uttered by an eminent authority, for certainly in the larger cities examinations are conducted generally with care and skill. We do not believe that the examiner is usually unable to recognize tube-casts, or even to test for albumen or sugar. Certainly unfit cases are occasionally passed, and we fear that the far-seeing millionaire, who takes a round block of insurance, is left to glide more easily by the examiners than the poor clerk who wants a small policy; but, taken all in all, there is much care exercised, and the results in mortality go far to show that the risks of reliable companies have been well selected.

Dr. Stillman, in his book, goes thoroughly into all questions. He gives us diagrams, colored and uncolored, and statistics by the page. While unable to enter into many of the questions he presents, we would say, at least, that in one point his judgment seems better than that of some recent writers on the subject. We allude to the so-called "physiological albuminuria." For while of late there has been an effort made to represent these cases as good risks, Dr. Stillman gives us the only safe ground for decision, without regard to the variety of albumen found. To the presence of tube-casts, etc., he says, "It must be decided by repeated examination that albumen is a constant factor, for the continued presence of albumen in the urine is a sufficient cause for rejection without the coexistence of any other symptoms." While the attention paid to this subject is comparatively recent, how are examiners to decide in any other way, for insurance deals with the future, by no means always the near future, and time alone will enable us to tell whether the man in whose urine albumen is constantly detected, though without evidence of kidney lesion, will prove as tough and long-lived as his fellow who presents no such abnormal peculiarity. E. W. W.

TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By John J. Reese, M.D.
Philadelphia: P. Blakiston, Son & Co., 1888.

Professor Reese's second edition of "Medical Jurisprudence and Toxicology" is written in his usual forcible and beautiful Anglo-Saxon. The importance of a thorough education in all medico-legal subjects goes without saying in this intelligent age, and yet there are very few works that present forensic medicine in a terse and comprehensive style. This production does seem to give the essentials of legal medicine, with its application to the law, in a simple, understandable manner, which is largely owing, as the doctor himself says, to the fact that greater prominence has been given to those topics of the most practical importance.

This edition has a marked value over the first in that it contains new material on blood-stains, suffocation, malpractice, and ptomaïnes, which latter subject at present is of particular interest and of vast importance. Only until within a few years all toxic alkaloid substances detected in medico-legal investigations by experts were regarded as having been *introduced* into the economy during life, so that it was possible for circumstantial evidence to wind around some faithful one in case of the victim of an animal alkaloid, and it is quite possible that people have suffered shame and death at the hands of the law through the ignorance of experts concerning these products of decomposition.

Microscopic identification of human blood-corpuscles is now being so refined that it becomes of the greatest interest. Doctor Reese's article on the differential diagnosis of blood-corpuscles is put in a very clear way, and gives the latest methods of determining dried human blood. This concise work certainly commends itself to both the medical and legal professions.

BERND'S PHYSICIANS' POCKET REGISTER. BERND'S PHYSICIANS' OFFICE REGISTER. Copyrighted by Henry Bernd, 1887. Improved edition copyrighted January 23, 1888. All rights reserved.
St. Louis: Henry Bernd & Co., 2631 Chestnut Street.

We are all willing to admit that perfection, in the matter of physicians' account- and call-books, is not yet realized, and would call attention to the above-named books, as presenting some new and useful features. They are exceedingly compact, on very remarkable paper, thin but strong, and of agreeable tint, and in their arrangement somewhat different from the usual forms. The pocket register contains three names on a page, and runs out the year. The book is well indexed and very complete. The only possible objection to its use as a call-book, it seems to us, arises from the question of how to make up the daily list of work with ease and speed, but if used as a regular book of entry the objection van-

ishes. The office register or ledger is of itself the solution of a long-felt want. Being thin, light, and easily handled, it will keep the full accounts—registering, if necessary, a visit every day in the year—for five hundred patients, and suffices for a large business. It can be used separately from the pocket register, in connection with any call-book desired.

LECTURES ON DISEASES OF THE EYE. By Chas. Bell Taylor, F.R.C.S. and M.D., Edinburgh, etc.
London: G. Redway, 15 York Street, Covent Garden, 1888.

The series of six lectures here given seem to us well worth reading. Their subjects are "Cataract," "Squint," "Glaucoma," "Optico-Ciliary Neurotomy," "The Use and Abuse of Mydriatics," and "Eye-Troubles in General Practice." While the first five are rather designed for the edification of the ophthalmologist, the last chapter should be read and remembered by all who engage in the general practice of medicine. It contains much information as to the recognition and management of the more common and easily recognized eye-diseases, and holds out in many places a warning-flag to the practitioner, heeding which, both he and his patients will be more likely to do well and prosper.

E. W. W.

THE PHYSICIANS' (PERFECT) CALL-BOOK AND RECORD FROM 18— TO 18—. By Dr. G. Archie Stockwell, F.Z.S. Thirty-two patients per page.
Detroit, Mich.: Geo. S. Davis, P. O. Box 470.
Mailed prepaid on receipt of $1.50, or to be had through booksellers.

The plan of this call-book is somewhat original. It is prefaced by the usual tables on metric system, obstetric calendar, differential diagnoses, tables of doses, drops, etc., and all the information which can well be compressed in twenty-four finely-printed pages. Its chief merit is in its elasticity. It can be used for any year or any month. You can begin at any time in the beginning of the book and go on. It is arranged by months, not by weeks. You can take one or twenty pages, or more, for one month, if you are a very hard-worked practitioner, and each page will accommodate thirty-two names. The book is small, well bound, and the paper is very good.

GRUNDRISS DER ARZNEIMITTELLEHRE. Von Dr. Oswald Schmiedeberg.
Leipzig: Verlag von F. C. W. Vogel, 1888.

It gives us great pleasure to welcome to our editorial table the second edition of Schmiedeberg's well-known "Principles of Therapeutics." The book is both German in language and German in characteristics, and belongs rather to the class of physiological treatises than works on practical medicine. As the output of one of the most famous exponents of drug physiology, we can commend it most highly to those of our readers who are acquainted with the German language.

Correspondence.

PARIS.

(From our Special Correspondent.)

As alkaloids always keep their rank among the most important therapeutic agents, every contribution to a better knowledge of their properties is ever of great interest. And it may here be remarked that our ideas of their constitution have been of late undergoing considerable change. But, not to wander into the realms of theory, suffice it to say that a very recent addition to our practical knowledge of alkaloids is the discovery that some cinchonine derivatives are strong convulsivants, and one of them, *cinchonigine, is exceedingly poisonous.* The derivatives in question were discovered, eight or nine months since, by Professor Jungfleisch, of the Paris College of Pharmacy, and M. Léger, of the Baujon Hospital, who obtained them by heating cinchonine with water and an excess of sulphuric acid to 120° C. (280° F.) in close vessels. Several new bases are thus formed, which can be separated by means of various solvents, the most important, cinchonigine, being dissolved out with washed ether. Fine specimens of the new alkaloids and their salts were shown at the time by MM. Jungfleisch and Léger during the meetings of the Paris Society of Pharmacy, and here their chemical history terminates so far as we are concerned. But biologists and therapeutists have pursued the subject further, and found the cinchonine derivatives to possess remarkable properties. Dr. Paul Langlois says they have a distinct convulsive effect, causing the tonico-clonic attacks already described by Dr. Laborde under the name of cinchonic epilepsy. Their toxic dose varies, however, and the alkaloids may be classified as follows, beginning with the weakest: cinchonidine, cinchonine, *cinchonibine, cinchonifine, cinchoniline,* and *cinchonigine.* The two named first are the familiar al-

kaloids; the four following, in italics, are the new derivatives alluded to. The last of them, cinchonigine, is so intensely poisonous that an intravenous injection of five milligrammes of it per kilogramme weight of animal, suffices to bring on the epileptic attack, while nineteen times as much cinchonidine would be necessary to produce the same effect. Cold-blooded animals are less easily affected, yet convulsive accidents were occasioned in tenches and frogs. At the same time these alkaloids act differently from strychnine, but here further investigations are necessary. And, finally, Dr. Langlois is of opinion that cinchonigine may very possibly exist in commercial impure alkaloids obtained by a long boiling with acids, followed by promiscuous precipitation, the poisonous alkaloid forming at the expense of the cinchonine during the extracting process.

Quite a breeze was raised the other day in the medical press about a communication read before the Academy of Sciences by its president, M. Janssen, who is an astronomer. The paper, an objectionable one it must be admitted, was a disguised advertisement for some sort of electrical institute where they cure cancer and such trifling ailments,—if their statements are to be believed. But the good president, who probably takes more interest in the changes of stars than in sublunary proceedings, did not perceive the device, and candidly read the note addressed to him, which consequently appeared in full in the *Comptes-Rendus* in December. It is unnecessary to say that the medical profession, here as jealous of its privileges as it is elsewhere, protested as one man against the proceeding, and raised such a clamor that the Academy cannot fail to have heard it and acknowledged its justice. However it may be, it is understood, unofficially, that henceforth all communications of a medical character shall, before publication, be referred to the Section of Medicine and Surgery. As the Section includes such members as Drs. Verneuil, Brown-Séquard, and Charcot, the Academy may in future rest assured that its *Comptes-Rendus* will escape questionable communications of the sort.

Strophanthus has been used successfully in *typhoid fever* by Dr. Poulet, of Plancher-les-Mines. According to the paper which he read before the Paris Therapeutic Society, he treated thus some sixteen dangerous cases, and lost only one. For this reason, and also owing to the doctor's reputation, the fact deserved to be noticed, but here the interest ends; for on discussing the communication at the society meeting, fault was found with the doses exhibited, discredit thrown on the sort of strophanthus selected, and the whole culminated into the usual endless discussion respecting the merits of the various strophanthines.

An improved process for detecting *urobilin* in urine has been proposed by M. Grimbert, head pharmacist of the Clinique d'Accouchement. As the method is simple and easily worked out, it may be useful to practitioners to here describe it. The urine is mixed with an equal volume of pure fuming muriatic acid and heated to commencing ebullition. After cooling, the liquor is shaken with ether, which turns to a pale reddish-brown color, with a very bright green fluorescence. With the spectroscope the ethereal solution affords the absorption band of urobilin, and on spontaneous evaporation leaves behind a garnet-red residue, soluble with fluorescence in chloroform, and without fluorescence in alcohol, glycerin, and acetone. Water dissolves it but sparingly. On operating with large quantities of urine, and keeping the residue in the exsiccator, needles of benzoic acid soon cover the surface. They originate from the hippuric acid of the urine turned into benzoic acid through the action of heat and muriatic acid. When the fluorescent ethereal solution is shaken with an alkali, ammonia, for instance, it becomes discolored, while the alkali turns to a deep red. On supersaturating the latter with muriatic acid, and shaking with fresh ether, a yellow solution is obtained, possessing but little fluorescence, but sharply showing the urobilin absorption band. On evaporating an orange-yellow residue is left behind. From the foregoing M. Grimbert thinks himself justified in thinking, as Jaffé did, that urobilin does not pre-exist in urine, but forms, under the action of oxidizing agents, through the splitting up of a coloring substance not hitherto isolated.

While on the subject of urine constituents, it may be appropriate to speak of *sulphocyanic acid* and its salts, for which M. Colasanti has found a new reagent especially adapted to their detection in all animal secretions in general. When a few drops of a watery solution of cupric sulphate are added to a solution, even very dilute, of sulphocyanic acid, or a sodic or potassic sulphocyanate, the liquor acquires a very fine emerald-green color, quite persistent, and varying in depth according to the proportion of acid con-

tained therein. So sensible is the reaction that a colored scale might be established, in the well-known manner, to estimate the quantity of acid present in various animal secretions. Experiments have shown that the cupric sulphate solution will clearly show sulphocyanates in solutions of 1 to 4000. As regards animal secretions, human urine will give the finest colored reaction. To this effect the urine should be prepared, according to Gscheidlen's method, by evaporation to one third of its volume, precipitation with milk of lime to separate the sulphates and phosphates, and finally filtration through paper. On adding to the filtrate, perfectly neutral, a few drops of the cupric solution, an extremely fine emerald-green color is developed, varying in depth according to the proportion of sulphocyanates. Human saliva will also afford a like reaction, but it must be prepared by precipitating the mucus with alcohol, evaporating and diluting the filtrate again with water. The reagent usually employed for sulphocyanates is ferric chloride, which produces a deep blood-red color. But M. Colasanti's reaction is valuable as a confirmation, because ferric chloride affords a red coloration with other substances than sulphocyanates, salicylates, for instance, which are to be found in the urine of patients taking these compounds in the course of treatment.

The experiments performed on the bodies of executed criminals seldom lead to practical results. Yet M. L. Laval has been successful in his investigations to ascertain whether it is possible to simulate death by poisoning through the introduction of toxic agents after the subject's decease. Four minutes after decapitation a solution of twenty-four grains of atropine sulphate in six ounces of water colored with fuchsine was introduced into the dead man's stomach, and fifty-two minutes later the poison was looked for in the subject's organs. The blood, urine, spleen, liver, kidneys, and intestines were examined in substantially the same manner, with similar results. To speak only of the liver, and to briefly describe the outlines of the process, one hundred grammes of the organ, finely divided, were macerated first with two hundred grammes of ninety per cent. alcohol, containing one gramme and a half of tartaric acid, and finally with a like quantity of plain alcohol. The liquors, being mixed together, were evaporated to dryness, and the residue was redissolved in distilled water, saturated with potassium carbonate and shaken with chloroform. After evaporating the chloroform, the residue was saturated with dilute sulphuric acid, and left to spontaneous evaporation over sulphuric acid. Very fine needles were thus obtained with all the characteristic appearance of atropine sulphate under the microscope. Some specimens were submitted to an expert microscopist, not aware of their origin, and by him most positively identified as atropine sulphate. At the same time, the experimenter admits, that, owing probably to the minute quantity of the crystals, they failed to give very clear chemical reactions. From the foregoing M. Laval has come to the conclusion that (1) on introducing poisons into the stomach after death it is possible to simulate a poisoning accident; and (2) in toxicological investigations the microscopic is preferable to chemical tests so far as atropine is concerned. The first clause will readily be admitted, provided the facts be established beyond cavil. But the second may be controverted. At all events it would be hard to obtain a verdict in a poisoning case upon microscopical evidence unsupported by chemical tests.

PARIS, December 21, 1888.

BERLIN.

(From our Special Correspondent.)

Not quite fifty years ago, in a clinical lecture on operations upon the skull, especially referring to the operations of trephining, the celebrated English surgeon, Sir Astley Cooper, made the following remarks: "This operation exposes to you the most important and sensitive of all organs. If the bone is removed, your hand must not tremble, your instrument must not deviate a hair's breadth, for only a thin membrane, the dura mater, lies between your patient and eternity. The least tear or puncture through this membrane is invariably fatal." To-day, thanks to antiseptic methods, the state of affairs is quite different. If we to-day contemplate the removal of any pathological product from the depth of the brain, not only is no dread felt on opening the dura mater, or even the pia mater, and laying bare the brain, but we even without dread cut down deep into the brain substance. In the last few years the great progress in the knowledge of brain-diseases has enabled the surgeon to undertake such operative procedures with considerable hope of success; but, nevertheless, the cases of successful operations on the contents of the cranium are so rare that the following case,

reported by Dr. Von Bergmann at the Berlin Medical Society on December 5, deserves to be considered somewhat at length.

The patient was a workman, 29 years of age, who, since his fifteenth year, had suffered from purulent discharge from the right ear. For the last three weeks he had complained of severe pains, which led him to visit an aurist, who sent him to the surgical clinic. With the access of the aural pains, attacks of dizziness occurred, with great prostration, especially in the evenings. His appetite had disappeared, and he frequently suffered from chills and fever. A few days before his admittance he complained of very violent headache, lasting both through the day and night, and rendering sleep impossible. This headache, with the feeling of chilliness, was the principal symptom of which the patient complained when admitted to the clinic. The patient gave the impression of being greatly reduced in strength, was very apathetic, wished always to remain in bed, and could then scarcely raise his head from the pillow. The skin was slightly jaundiced, the tongue thickly coated, the temperature 39.7° C., respiration 24, and pulse only 50 in the minute. There was no marked disturbance of movement in the extremities; when, however, the patient tried to put his arms out in front of him, after a few minutes, his left arm gradually sank, while the right remained in the extended position. The sensibility to pricking with a needle on the left arm and leg appeared to be decidedly less than on the right, while the strength of the left hand was likewise weaker. Twitching of the muscles in the regions of the right facial nerve, on the side corresponding to the diseased ear, occurred during examination. As this attack passed off, the lower fibres of the facial nerve appeared to be paralyzed; the tongue showed no deviation from the normal position when extended from the mouth; the pupils were equal in size, and reacted to light; there was no motor disturbances of the ocular muscles. In the right external auditory canal there was a thick, offensive pus. After washing this away, the deeper parts of the canal were found to be filled with granulations, while the upper wall of the canal was swollen and protruded downward. The granulations bled on slight touching with the sound. When they were raised up with the sound, the pus from beneath them obtained ready exit; no diseased bone could be detected by the sound. The mastoid process was not swollen, was insensitive to pressure, while the tympanic cavity, which was filled with granulations, was very sensitive. Pressure on the auricle was not especially painful, although drawing upward and backward caused considerable pain. Hearing was normal in the left ear. In the test of the right ear, ticking of a watch could not be heard at all, while moderately loud speaking was heard at a distance of three paces. Tapping on the skull with the finger, or with a percussion-hammer, only led to the increase of the pain when the skull above the auricle was struck; while no increase in the pain followed the percussion of the mastoid process. While the process of suppuration evidently implicated the upper portions of the tympanum, its extension into the chambers of the mastoid process appeared to be capable of exclusion. The question at once arises, "Is this suppuration sufficient to explain the febrile reaction?"

The patient stated that in the last three weeks, while under regular medical treatment, the quantity of pus had been greatly reduced; the extension of the suppurative process into the adjacent cavities did not appear probable, and, as a consequence, the extension of the suppuration in some other direction had to be assumed. The febrile reaction and disturbances of the general health were such as might be expected from deep abscess formation. The chills, the evening febrile reaction, a dry, coated tongue, thirst, and great depression and lassitude—all these symptoms, together with a disease whose history pointed to the collection of pus—are enough to attribute the febrile symptoms to the possibility of a deep abscess formation. If it is admitted that these render the presence of a brain abscess probable, the question first raised is in regard to specific cerebral symptoms. A small abscess in one of the cerebral hemispheres only gives rise to symptoms when it is a lesion in the immediate neighborhood of the cortex. It is well known, for example, how large an abscess in the frontal lobes may become without giving rise to any symptoms which can indicate its existence. So, also, in the temporal lobe, we can only count on the presence of an abscess when its volume has become so excessive as to lead to disturbances which are attributable to pressure, to symptoms which are explainable through disturbances of the circulation in the cranial cavity, and which are grouped under the head of symptoms of increased cranial pressure.

In the history of the disease of the patient under consideration, attention is to be espe-

cially directed to the violent headache which came on suddenly, and steadily increased in severity, the dizziness, the great depression of the patient, the difficulty with which he responded to questions, the impossibility of raising his head, and especially the considerable reduction of the frequency of the pulse. Even while in the clinic, his pulse fell in a few hours from 64 to 50 and then to 46 beats in the minute, a symptom which, in connection with the history of the case, clearly pointed to some disturbance leading to pressure on the cranial contents. The presence of chronic suppurative disease of the middle ear pointed to the presence of an abscess of the brain, and in all probability to one of considerable size. The question was raised as to where this abscess was located; a large accumulation of pus could not be looked for between the bone and the dura mater, but in all probability in the white substance of the hemisphere, whether in the temporal lobe or in the cerebellum. The violent pains which percussion of the right side of the skull produced in this patient, together with the fact that the seat of the suppuration was in all probability confined to the tympanum and its upper surface, with the integrity of the mastoid cells,—all pointed in the strongest way towards the temporal lobe as to the seat of the disease. Naturally a closer localization of the abscess was desirable, for the temporal lobe may be the seat of extensive degeneration without leading to any specific disturbance of the cerebral functions.

Modern physiology locates the centre for hearing of one ear in the temporo-sphenoidal lobe of the opposite side. From the fact, however, that this was perfectly sound, and the hearing normal, it could not be concluded that the temporo-sphenoidal lobe on the opposite side was diseased; for it is claimed that the centre of hearing lies not in the cortical centre, but in the white substance,—and the former, not the latter, apparently would be disturbed by the abscess. In general, it may be assumed that a large abscess in the temporo-sphenoidal lobe increases the intra-cranial pressure in all directions from higher tension of the cerebro-spinal fluid, although it might be naturally expected that the pressure in the neighborhood of this would be more increased than in more distant regions. It is therefore, perhaps, warrantable to assume that in a large abscess in any place in the right hemisphere the functions of this part in general would be more reduced than those of the unaltered left hemisphere. In fact, the left extremities were disturbed in both their motor and sensory functions. No clue as to the locality of the abscess could be made from the right-handed paralysis of the facial nerve. The above consideration led to the conclusion that there was an abscess located in the right temporal lobe, and Professor von Bergmann resolved to operate upon it. If a line is drawn tangent to the most posterior point of the posterior border of the auricle, and another drawn tangent to its most superior point, these lines intersect above and a little in front of the posterior lower part of the parietal bone. An opening at this point renders it possible to strike the posterior section of the temporo-sphenoidal lobe and expose its lower convolutions. The opening made on the patient was three or four centimetres in length, and the exposed dura mater appeared perfectly normal. It was divided, and immediately the external portion of the brain protruded: on incising this there was bleeding, but no pus escaped. The brain-substance was so nearly fluid that it was difficult to keep the edges of the wound, which was nearly two and a half centimetres in length, separated. The knife was inserted three times before the location of the pus, a little in front of the opening, was reached; and then a greenish-yellow, very offensive pus escaped to the amount of about thirty cubic centimetres. The examination showed an abscess cavity, with flat walls, completely surrounded on all sides by softened matter. Ethereal solution of iodoform was very carefully injected into this cavity, taking care not to produce great pressure; then a drainage-tube was inserted for about one centimetre. Iodoform gauze was loosely packed around the drainage-tube through the cerebral wound so as to fill the wound.

It is hardly necessary to say that the operation was performed with all possible antiseptic precautions. The entire skull was shaved, washed with soap and warm water, ether and sublimate solution was used during the operation, and the bleeding from the skin and the pia was carefully arrested. Before the operation the ear was washed out as thoroughly as possible with a solution of boric acid and filled with iodoform and a plug of iodoform gauze. On the removal of the pus the pulse rose from 50 to 54, and four hours later was 88 pulsations in the minute. The patient stated that his headache had entirely disappeared, and it has not yet returned. Late in the evening of the day of operation, the temperature was still 39.7° C; after sleeping the entire night, the temperature was 37.5° C.; pulse 68. The paresis of the facial nerve is still present, as well as the

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slightly disturbed condition of the left arm. At the daily dressing iodoform was omitted after the second day, and the progress of the wound, in which a single stitch had been placed at the lower angle, was as favorable as possible; the drainage-tube was shortened on the ninth day, and reduced in calibre. No fever or headache were at any time present, and there was no prolapse of the brain-substance. The granulations were frequently cauterized with nitrate of silver. In less than six weeks the wound had cicatrized, and the cicatrices were deeply depressed. The secretion of the ear has not yet ceased, but is considerably reduced in quantity, and is still under treatment.

A therapeutic measure which for many years has almost passed into forgetfulness has been again brought forward by no less a man than Leyden. In 1864, Kühne, now Professor of Physiology in Heidelberg, and then assistant in Virchow's Pathological Institute in Berlin, recommended the transfusion of blood as a therapeutic measure in poisoning with carbonic oxide. He based his theory on the fact that the poisonous action of carbonic oxide caused the expulsion of the oxygen from the blood; in the degree in which the carbonic oxide substituted itself for this gas to that extent did the blood become incapable of absorbing new oxygen,—and since we know of no method of removing carbonic oxide from its combination with the blood, the blood-corpuscles thus poisoned become completely unfitted for carrying on the gaseous changes of respiration.

In such cases of poisoning, therefore, nothing can be expected from artificial respiration; only a substitution of new for the diseased blood can save the case. No better means of accomplishing this can be thought of than the performance of transfusion of blood. Transfusion of blood has been attempted a number of times in cases of poisoning from carbonic oxide, a few times without success, at other times with a favorable result. For the last fifteen years, however, or perhaps even longer, no case of poisoning with carbonic oxide, treated by transfusion, has been reported, probably from the fact that transfusion of blood as an operation has in recent times fallen into disuse. Leyden, however, has taken up the subject anew, and, from the case reported, boldly draws the conclusion that transfusion of blood is a justifiable and promising method of treatment in cases of poisoning with carbonic oxide. He believes it probable that in a series of cases of poisoning with carbonic oxide, the amount of blood sufficient to sustain life until the organism eliminates the poison and the blood regains its functional activity may be supplied through transfusion. The patient which Leyden brought forward in his clinical lecture, and later at the Society for Internal Medicine, was occupied in laying a gas-pipe in a newly-built hotel. Late at night, while tired with his work, he lay down in a small room in the neighborhood of the place where he was working. As it was very cold, he lighted a charcoal fire, and with a companion went to sleep. About five o'clock in the morning of the next day both were found unconscious. A physician, who was summoned, attempted artificial respiration and stimulating measures, and had the patients brought to the clinic, where they arrived in a perfectly unconscious condition. One soon recovered consciousness, but the other remained in deep coma. Bleeding was practised, artificial respiration was employed, all without success. At about half-past eleven the patient was still unconscious, lying perfectly motionless, reacting to no irritation of cornea, no response to the irritation of the phrenic nerve, the pupils unnaturally contracted, respiration faint and sighing. The tongue had a tendency to fall back into the throat and lead to suffocation, and had to be drawn out of the mouth, and so rendered respiration somewhat freer. A short time afterwards respirations were 32 in the minute, very superficial, and weak. The pulse was 100, with little power; arterial pressure very slight. Shortly afterwards the patient, whose lips and cheeks had before been of the normal color, became cyanosed and blue and cold; the forehead and face were covered with sweat; pulse was weaker, 120 to the minute; the radial artery could scarcely be felt. Transfusion was performed at one o'clock; three hundred cubic centimetres of blood were drawn from a strong, healthy man, and received in a vessel placed in hot water. After the blood had been defibrinated and filtered, it was injected, after Esmarch's method, in the median basilica vein, which was freely exposed and ligatured on the peripheral side of the opening, more than two hundred cubic centimetres being injected. After the central extremity of the vein had been ligated, the wound in the skin was closed with three sutures. About ten minutes after the operation the respiratory movements were 40 to the minute; the pulse 120 and somewhat stronger; the tension of the arteries was not changed,

and the unconsciousness persisted. At six o'clock in the evening the pulse was 120, stronger; the arterial tension had improved; the temperature, 38.6° C.; the face somewhat less cyanotic; the skin on the entire body warm and moist. The patient opened the eyes on pricking with a needle and turned over in bed. On the morning of the next day at half-past three the patient opened his eyes, gave his name on being asked, drank some milk, and again went to sleep. At eight o'clock in the morning he sat up in bed, drank coffee, and ate some bread with appetite. Respiration was now 24, regular, and abdominal; pulse, 88 and strong; arterial pressure normal; temperature, 37.2°; expression normal; no cyanosis; the eyeballs less prominent and the pupils reacting to light; the abdomen not swollen; the urine specific gravity, 1020, clear, without sugar or albumen. He complained of numbness, slight frontal headache, and a little pain in the left arm. The patient slept the greater part of the day, but could be readily aroused to take his food. Respiration 24, pulse 90, temperature 37.2°, specific gravity of urine 1013, with no albumen or sugar, and, with the exception of slight sleepiness, was perfectly well. Leyden has no doubt that in this case transfusion saved life, and he recommends the employment of this method in similar cases.

Notes and Queries.

ON INTESTINAL FERMENTATION IN CHILDREN.

Bednar was one of the earlest writers who put forward the theory that primary abnormal decomposition of food was a cause of diarrhœa in children; his views were accepted by Henoch. In 1881, Uffelmann made examinations of the various bacteria found in the fæces, and Escherich pursued this subject by the aid of Koch's method of cultivation. He found that the bacterium lactis ærogenes determines strong fermentative action in carbohydrates, and especially in milk-sugar; that this process develops lactic and carbonic acids, hydrogen being set free, and is possible without the presence of oxygen. Albumen is not split by this bacterium. Another form, the bacterium coli, has but slight fermentative properties. Dr. Adolf Baginsky, in a paper recently read before the Berlin Medical Society, in the main confirms Escherich as to the presence and properties of these two bacterial forms, but with some important differences. The following are conclusions already published by Dr. Baginsky in the *Zeitschr. f. Physiolog. Chemie:* 1. Escherich's bacterium lactis ferments milk-sugar, very small quantities of lactic acid being formed, and acetone being set free. 2. Most of the acid formed can be shown to be acetic acid. 3. This formation occurs with or without access of air. 4. Bile constituents do not prevent this acetic acid fermentation, therefore this process may go on in the intestine. 5. The bacterium changes neutral lactates into butyrates. 6. It does not change starch into sugar. 7. Acetic acid is produced by its action on starch only when oxygen is present. 8. It does not decompose casein. 9. The gases accompanying the formation of acetic acid are CO_2, methan, and H_2. This process is, therefore, not a lactic acid fermentation, but a methan fermentation of acetic acid (Hoppe-Seyler). 10. The bacterium slowly decolorizes methylene blue, and, therefore, forms reducing material in moderate quantity, which may act by diffusion at a distance. From these conclusions follows the result that the name of this bacterium should not be bacterium lactis ærogenes, but bacterium aceticum.

Now, as to the practical consideration of this subject, which will be found to be of the highest clinical interest. Cultivation experiments show that the formation of acetic acid destroys this bacterium, a very small quantity being sufficient. Further, when cultivations are made from the fæces of children suffering from acid diarrhœa, two bacterial forms are isolated; one of these separates a greenish coloring-matter, is common in water, and appears to be identical with the bacillus which the French observers, Hayem and Lesage, have recently rather rashly made answerable for the green diarrhœa of children. It fluidifies gelatin. The other form also fluidifies gelatin, but more slowly and superficially, a white cuticle forming, and a whitish mass sinking to the bottom. This form is constantly found in infantile diarrhœa, and probably plays an important part in that disease; it is quickly fatal in animals. If we try to cultivate this form and the bacterium together, the former is prevented from developing if milk-sugar be present. Thus the modern antibacterial treatment contains an element of failure. Supposing it to be successful in destroying germs, which is not usually the case, it interferes with the independent destructive power of the bacilli upon each other. The above facts by no means ex-

plain all the phenomena of infantile diarrhœa. The origin and action of the various phenomena are not well known as yet, and, besides this, the relations are different from those existing in other organs. Workers have hitherto restricted their field of labor detrimentally, and, besides, there is great disagreement.

Some impute all the symptoms of infantile diarrhœa to undigested casein; some make very light of this, and assume the action of bacteria as the sole cause. The fact that cow's milk usually agrees very well in winter, but in hot weather often causes summer diarrhœa, favors the latter view. Some, again, assert that acid, others that alkaline, fermentation, is the cause of the trouble. All sorts of poisonous ptomaïnes (tyrotoxine, etc.) are accused by other observers. The conditions surrounding milk digestion are extremely complicated, and we cannot imitate them in a laboratory. Each secretion pouring into the intestine has its own specific properties. All surrounding organs, and the intestinal wall itself, will be influenced by derangement of the normal process of digestion. "It is a great error to say, with Legendre, that pathological alterations are merely the consequences of abnormal decomposition, though I once leaned to this view myself; and this error underlies most recent teaching on dyspepsia in general. There is an unbroken chain of sequence from simple catarrh to complete atrophy of the mucous membrane. There is no doubt that in every dyspepsia there is anatomical lesion of the gastro-intestinal wall in more or less degree, and though fermentation-processes may act as the primary cause, they do not account for the subsequent phenomena."

To return to these processes: we have seen in the acetic acid fermentation caused by the bacterium aceticum a means by which the infantile organism can ward off pathogenic bacteria from the intestinal wall. But if this fermentation exceed a certain limit, not only is the bacterium aceticum itself destroyed, but a number of abnormal results follow. The alkaline pancreatic secretion cannot act properly; peptonization of albuminoids, emulsification of fats, and amylolytic action are all hindered. The acetic acid is itself an irritant, and if it go on to methan formation by continued fermentation, the gases which are formed cause colic. A catarrhal condition of the mucosa is induced, absorption is hindered, then ensues destruction of the epithelium, and other changes follow. The primary (acid) fermentation is followed by a second (alkaline), as Escherich has rightly observed, and this author founds a dietetic system thereon. He proposes to give only albuminoids, and no carbo-hydrates during the first (or acid) kind, but during the second mainly carbo-hydrates, the albumen supply being much restricted. But peptones are badly borne by the intestine in early life. Again, the so much vaunted dextrines are not free from starch, and hold a good deal of nitrogen. They pass the upper part of the gastro-intestinal tube as "undigested ballast," and in the lower part set up fermentation of the worst kind. It is not easy, moreover, to say which kind of fermentation is originally present, though the urine reaction may assist us.

It has long been known that sugar agrees well in certain diarrhœas. Raspe has lately advocated milk-sugar, and Hirschler has shown that carbo-hydrates restrain albumen decomposition. Now dextrine cannot be considered equivalent to milk-sugar, still less can the complicated "infants' food."

In all this dietetic treatment the intestinal tract is too exclusively considered, the mucous membrane itself too little. Our object should be not so much to avert a wrong fermentation, as to fight against and cure a dyspeptic derangement (starting from the mucosa). Escherich's diet may be suitable for one part of the intestine, not for another. Every therapeutic is partly empirical, many are altogether so. It is known that calomel in small doses will often stop diarrhœa, and it is said that this is from its antifermentative (or antibacterial) action. Experimentally, a trace of calomel in the gelatin prevents almost entirely the growth of bacterium aceticum, and this may explain the undoubted usefulness of calomel in sudden diarrhœa in children, due apparently to fermentation of milk-sugar in the milk-supply. Morax has recently brought fresh support to this theory.

It is known that certain materials (phenol, scatol, indol, etc.) are formed in the decomposition of albumen (Baumann, Brieger, Salkowski), and appear in the urine as ether-sulphuric acids. They can be quantitatively estimated, and form a measure of the albumen decomposition going on within the intestine. Now Morax finds that on this latter process calomel exerts no influence,—that is, in the doses that can be given. We may presume, then, that calomel acts exclusively on the fermentative properties of bacterium aceticum and similar forms.

It is desirable that we should have a

clearer knowledge of the values of different substances as antifermentatives. Macfadyen places the organic acids first. This may explain the value of lactic acid, recently recommended by French authors; also of kefir, koumiss, and acid milk. "I have examined some substances myself," says Dr. Baginsky, "and I find that naphthalin does not affect the growth of the bacterium aceticum; benzoic acid, boric acid, and resorcin hinder it completely; iodoform restrains it." Again, we require to know what kind of fermentation is going on. The reaction of the fæces tells us nothing as to this. Müller, Baumann, and others assert that this knowledge can be obtained from the urinary examination, by quantitative examination of the ether-sulphuric acids and indoxyl, and the general acidity,—a complicated process.

The best way of considering the treatment of infantile diarrhœa is to endeavor to form some opinion as to the part affected and the pathological changes going on therein. The suitable medicines can then be used, without much regard being paid to the nature of the fermentations. The indications are manifold, and the materia medica affords a good selection of remedies. Upon these indications depends also the kind of nourishment to be adopted,—often a difficult problem. No part of medicine requires more observation and acute reasoning than the dyspeptic diseases of children, but no part more repays the trouble bestowed upon it by the physician.—*British Medical Journal*, October 27, 1888.

ASELLINE AND MORRHUINE.

Notwithstanding that cod-liver oil has attained so important a position in the materia medica, it is still numbered among the remedies imperfectly understood as to the principles upon which their therapeutic action depends. A short time since (*Pharm. Journ.*, July 28, p. 62) Messrs. Gautier and Mourgues reported upon several bases of the nature of leucomaïnes that they had discovered in the light brown variety. Four of these were volatile, and were identified and described as butylamine, amylamine, hexylamine, and hydrodimethylpyridine. Two fixed bases, which were then briefly referred to under the names aselline and morrhuine, are now described more fully, the latter apparently being of some physiological importance (*Compt.-Rend.*, cvii. 626). They were obtained by extracting with ether the basic paste left after distilling off the volatile bases, evaporating the ethereal solution, dissolving the residue in dilute hydrochloric acid, and treating the solution with perchloride of platinum, when two platinochlorides were formed, one insoluble, the other soluble, in the cold. The base separated from the insoluble compound is named "aselline," and represented by the formula $C_{25}H_{32}N_4$. It is described as forming crystalline salts, being a nearly colorless amorphous mass, which is colored green if not preserved from the action of light, sp. gr. about 1.05, and melting to form a yellowish viscous liquid that has an aromatic odor, recalling that of the ptomaïnes. It is nearly insoluble in water, to which, however, it communicates a slight bitterness and faint alkalinity; but it is soluble in ether, and more freely in alcohol. This base was found to be relatively feeble in its physiological action; nevertheless, it produced symptoms of fatigue, shortness of breath, and stupor, and a greenfinch was killed by three milligrammes of it in fourteen minutes. Morrhuine ($C_{19}H_{27}N_3$) was obtained as a crystalline platinum compound on concentration of the mother-liquor after the removal of aselline. The free base formed a very thick, oily, amber-yellow liquid, lighter than water, and only slightly soluble in it, very alkaline and caustic to the tongue. It constituted two-thirds of the total bases found in cod-liver oil, each tablespoonful of the oil containing about two milligrammes. It manifested the power of exciting the appetite, as well as the most remarkable diaphoretic, and especially diuretic, properties. A guinea-pig, weighing two hundred and forty grammes, into which .029 gramme of morrhuine had been injected in the state of hydrochlorate, lost in two and a half hours by transpiration, and especially by urination, 13.5 grammes. The diuretic and diaphoretic properties of cod-liver oil have been long known, as well as its power to excite the appetite, and it appears probable that these may be associated with the occurrence of morrhuine.—*Pharmaceutical Journal and Transactions*, November 3, 1888.

COMPOUND GONORRHŒAL INFECTION.

The accidental or more or less accidental presence of two specific micro-organisms in the same subject has often been observed. Thus, the bacillus of tubercle and the special germ of erysipelas may be found to-

gether, or the gonococcus may be detected in company with the septic micrococcus of puerperal fever. Dr. Bumm, of Würzburg, claims to have discovered certain true compound infections (*mischinfectionen*) where the first germ has really caused the entry of the second, or, rather, rendered the tissues more fit to receive it. The first germ, in the cases which he has investigated, is the gonococcus, the second is in some instances a pyogenic micrococcus, in others the bacillus tuberculosis. When fresh gonorrhœal discharge enters Cowper's gland, it tends to destroy the glandular tissue and to cause cystic degeneration; but when the pyogenic staphylococcus follows the gonococcus, suppuration occurs, and the pus-producing micro-organism supplants the specific germ of gonorrhœa. This is always the case in the compound infection which Bumm has investigated. The urethral follicles may be infected in the same manner, and so may the mucous membrane of the bladder. The gonococcus cannot readily penetrate the stratified vesical epithelium, but it favors the entry of another coccus, which is pyogenic. In the upper part of the genital tract the gonococcus itself only attacks the mucous membrane. Had it the power of penetrating deeper, gonorrhœa would, as a rule, be a very dangerous disease. However, the gonococcus favors the entry of more dangerous germs into the pelvic connective tissue. Thus Bumm discovered staphylococcus aureus in abscesses formed in two cases of gonorrhœal parametritis. In two other patients who had parametritis without abscess, as a result of gonorrhœa, he punctured the phlegmon, and found that the little fluid which drained away was entirely free from germs of any kind.

The higher the gonorrhœal infection extends above the cervix uteri, the less will be the chance of compound infection, for the vagina and vulva, favorable receptacles for all kinds of germs, will be far from the infected regions. Hence few micrococci besides the gonococcus can be found in gonorrhœal discharge from the uterus, and hardly any in the Fallopian tube. Thus it is in the tubes that the pure specific action of the gonococcus may best be studied. The tubal mucous membrane may become the seat of purulent inflammation, but the subjacent connective tissue escapes. Should any of the gonorrhœal pus escape through the ostium into the peritoneal cavity, the tube is rapidly closed up by circumscribed peritonitis. When pyogenic micrococci enter the peritoneal cavity, as when a puerperal parametric abscess bursts, severe diffused peritonitis almost certainly follows. Dr. Bumm doubts if any authentic case of compound gonorrhœal infection of the tubal mucous membrane has been noted.

Thus there appears to be a distinct compound infection where gonococci prepare the tissues which they infect for pyogenic germs such as streptococci, staphylococci, etc., the latter rapidly supplanting the gonococci, as above explained. In a limited series of cases, tubercular changes in the epididymis have been known to follow closely on an attack of gonorrhœa. Dr. Bumm believes that tuberculosis of the Fallopian tubes often arises in the same way; his theory explains, in his opinion, the origin of the tubercular masses which are sometimes found in the tubes in subjects free from tubercle in any other part of the body. The dried-up pus in an old pyosalpinx is a favorable cultivating medium for the bacillus tuberculosis. He succeeded in curing, or almost curing, a young woman of gonorrhœa of the cervix and repeated attacks of parametritis on the left side. She married, and two years later returned to hospital, where she died of isolated tuberculosis of the left Fallopian tube. The patient had never conceived, and the husband was phthisical.

Dr. Bumm shows that it was in female subjects that the first researches were made to determine the nature of the fluid found in the synovial cavity of a joint affected with gonorrhœal rheumatism. True pyogenic micrococci were discovered, but no gonococci could be found. This fact is entirely in accordance with his theory and demonstration of compound gonorrhœal infection. The genito-urinary mucous membrane, damaged by the ravages of the gonococcus, allows the entry of pyogenic micro-organisms into the deeper tissues. He admits that nobody has been able to explain why the more formidable and less specific germs make for the articulations, and more especially select the knee-joint.—*British Medical Journal*, December 8, 1888.

DIHYDROBROMIDE OF QUININE FOR SUBCUTANEOUS INJECTIONS.

The inevitable disappointment experienced by physicians from the application of the oleate of quinine in cases where neither the stomach nor rectum will accept quinine has rendered it so desirable to obtain a suitable preparation of quinine for subcutaneous injection that many efforts have been made

to produce such a salt, but with moderate success.

The difficulty has been to obtain a salt of quinine sufficiently soluble in water to make a solution concentrated enough to bring the dose within the limited capacity of the ordinary hypodermic syringe, and yet have it free from caustic or irritant qualities that might set up local inflammation. A solution containing about three grains of the alkaloid (quinine), or three grains and nine-tenths of the ordinary sulphate of quinine, in sufficient water to make thirty minims of solution, may be considered the proportion which is not too dilute and not too caustic by concentration for hypodermic application. It was thought at the time of the adoption of the last revision of the United States Pharmacopœia that the hydrobromide of quinine would meet the requirements, but it is to be regretted that the hydrobromide of quinine described by the Pharmacopœia cannot be found in the market, and manufacturers assert that it cannot be produced.

The Pharmacopœia defines a neutral or slightly alkaline salt soluble in about sixteen parts of water at (15° C. 59° F.), but no one has been able to obtain a hydrobromide of quinine in the market that can be dissolved perfectly enough for subcutaneous injection in less than about seventy parts of water at 15° C. (59° F.).

This important point of solubility in water has been the cause of failure by physicians in all attempts to use it hypodermically. An extemporaneous solution prepared by dissolving ninety-six grains of quinine (alkaloid) in sufficient quantity of hydrobromic acid, and adding water enough to make one fluidounce of solution, has long been used by physicians in the malarial districts of the South with good results. Such a question is unquestionably better than any that can be prepared from the official hydrobromide of quinine, but it is not free from irritant qualities.

In the *New York Medical Journal* for December 16, 1888, Dr. Jas. P. Parker suggests that a better preparation is obtained by direct combination of the hydrobromic acid with the base and crystallization from the solution. The chemical formula of this crystalline salt is a little uncertain, but is probably $C_{20}H_{24}N_2O_2(HBr)_2 + 3H_2O$. (It has not been ascertained whether it has two or three molecules of water of crystallization, but it most probably has three.)

As the foregoing formula indicates, it is a dihydrobromide, consisting of two molecules of hydrobromic acid and one molecule of quinine (alkaloid). This salt is as permanent as any of the acid salts of quinine, and is soluble in five parts of water at 15° C. (59° F.), and, when dissolved in that quantity of water, the solution will have a specific gravity of about 1.056, being about the same as that of the blood. This acid salt closely resembles that of a foreign make that has appeared in the market at a very high price, and is well adapted for subcutaneous application.

The writer has administered it subcutaneously a large number of times, and has as yet produced no abscess. It undoubtedly comes as near to being the desired salt as any that has been proposed.

As all the world knows, the bromine element tends to correct quininism, even in small doses, and when large doses are required, as in pernicious intermittents, it becomes effective for good.

"INFECTIOUS JAUNDICE."

Dr. W. P. Vassilieff contributes to the *Ejenedělnaya Klinicheskaya Gazeta* of St. Petersburg an interesting article on "Infectious Jaundice," founded on observations made in the Alexandrovski Military Hospital in 1883. There were eleven cases, at first somewhat puzzling, of an acute infectious disease, which has recently been described under several different names,—typhus hépatique, nephro-typhus biliosus, typhus abortivus cum ictero et nephritide, morbus sui generis, etc. This disease is usually met with as a sporadic affection. There is fever very often at the beginning, then enlargement of the liver and spleen, jaundice, and kidney-trouble. The disease usually terminates favorably. From the histories of the eleven cases given by the author, it is clear that it is an acute general affection, which commences suddenly with a chill. In some patients nausea, and even vomiting, occurred, after which there were general debility and severe pains in some of the joints, often also in the muscles, especially those of the lower extremities; the appetite was usually bad at the beginning; sometimes there was very great thirst; the patients generally slept badly, and frequently suffered from delirium. When the cases were seen early the temperature was found to be high, the pulse soft and rapid; the tongue was moist and slightly

coated; the skin hot and dry. At the beginning there were usually observed enlargement and tenderness of the liver and spleen. Albumen and sometimes casts were found in the urine; also, when there was jaundice, bile pigment. The lungs sometimes were affected slightly (with bronchitis); in two cases pleurisy occurred. The bowels were usually constipated at the beginning. Later on they were sometimes relaxed, the motions generally being colorless. Frequently at the commencement, and sometimes throughout the whole illness, there were attacks of epistaxis; occasionally also herpes labialis occurred. No micro-organisms could be detected in the blood. The patients, especially when they were admitted in an early stage of the disease, gave the impression of great prostration, but after some days this passed away, and they began to get better. The temperature generally fell about the eighth day, sometimes as early as the seventh, at others as late as the eleventh; sometimes there was a second rise of temperature, which did not usually appear to affect the patient much. Although the disease was of such short duration, the patients after the temperature had fallen appeared to be extremely weak, and regained strength somewhat slowly. Although Dr. Vassilieff has only recorded eleven typical cases, he has from time to time had an opportunity of observing others of a similar character in the hospital. One of these proved fatal; at the post-mortem examination extravasations of blood were found on the serous and mucous membranes, and slough of the mucous membrane of the pharynx. Thirty-six other cases have been described by Landouzy, Mathieu, Weil, Goldschmidt, Wagner, Roth, Aufrecht, Fiedler, and Haas; at least, Dr. Vassilieff has come to the conclusion that his cases and theirs are all examples of the same affection. This disease is met with chiefly in the summer, and nearly always affects workingmen, only three cases being on record where the patients were women; most of those affected were between sixteen and twenty-five years of age. It occurs in different parts of Europe in the form of a sporadic, acute, feverish affection, with severe nervous symptoms, and with enlargement of the liver and spleen, functional kidney disturbance, jaundice, and pains in various groups of muscles. In Dr. Vassilieff's opinion, it bears most resemblance to the bilious typhus met with in Egypt and Smyrna and described by Drs. Kartulis and Diamantopulos, and it appears to be a disease *sui generis*, differing from recurrent bilious typhus. —*Lancet*, December 1, 1888.

A CASE OF POISONING BY OIL OF SASSAFRAS.

In the *Cincinnati Lancet-Clinic* for December 8, 1888, Dr. L. M. Albright reports a case of a young man, aged 18 years, who took by mistake a teaspoonful of oil of sassafras. He noticed in a few minutes strange feelings about the head. In half an hour hallucinations (declared he was in heaven) and occasional vomiting. Half hour later unconsciousness; vomiting continued when disturbed or on any exertion, followed by great prostration and relaxation.

Two hours after taking, the extremities cold. Radial pulse could be detected with difficulty. Continued in this way until Dr. Albright's arrival, two hours later,—about 6 P.M.,—the drug having been taken at 2 P.M.

At this time Dr. Albright found him with pupils somewhat dilated; pulse at wrist barely perceptible; respiration, 12 per minute; extremities cold. Could be roused with difficulty, but incapable of comprehending or answering questions or of recognizing any one. On attempting to administer some egg albumen he vomited again. Barely a trace of the odor of the oil could be detected, and it was concluded it was mostly ejected from the stomach. The vomited matter contained abundance of very tenacious mucus. Concluding that the violence of the storm had passed, quiet was ordered, with heat to extremities, and an egg-nog composed of the whites of two and yolk of one egg, a tablespoonful of wine, with cream to fill the tumbler, and to give him a few swallows whenever he would take it. He regained complete consciousness by midnight, and was ready for breakfast in the morning, and with the exception of feeling a "little weak," made no further complaint.

THE POISONOUS EFFECT OF DIFFERENT GASES ON ANIMALS.

M. Pasteur has, as is well known, pointed out a method of destroying injurious animals, particularly rabbits, by placing fodder saturated with liquid cultivations of fowl-cholera in front of their warrens. According to the Paris correspondent of the *British Medical Journal*, December 15, 1888, M. Grèhant

has lately attempted to determine what quantities of gas or poisonous vapors would produce the same results, and might be employed instead of M. Pasteur's method in certain cases, especially for carnivorous animals, such as the fox. In order to imitate the conditions in which rabbits live in their warrens, M. Gréhant placed these animals in large glass vessels sixty-eight centimetres high, thirty centimetres in diameter, and capable of containing forty-eight litres. The gas or vapor to be mixed with the air was introduced by a tube at the bottom of the vessel, and escaped through the glass plate which covered the top incompletely. The following experiments were made with different poisonous vapors: *Carbonic acid:* 1. A mixture composed of seventy-five parts of carbonic acid and twenty-five parts of air was introduced into a glass vessel in which a rabbit had been placed. At the end of three minutes the rabbit fell on its side; after six minutes the respiration became slower; after ten minutes the animal was completely anæsthetized. It still breathed, and, on being placed in the open air, it returned to consciousness, and in ten minutes completely recovered. The dose of carbonic acid was, therefore, inadequate. 2. A current of pure carbonic acid was then introduced into the glass vessel. In two minutes the rabbit was seized with severe dyspnœa; it lay on its side, with the eyes protruded, the pupils dilated; in four minutes it expired. It was ascertained by means of the mercury-pump that the vessel contained ninety-two per cent. of carbonic acid. *Carbonic oxide:* 1. An atmosphere composed of ordinary air and one-fiftieth of carbonic oxide was introduced into a glass vessel containing a rabbit. After two minutes the animal panted; at the end of five minutes its ear became very red; it fell down, but at the end of ten minutes it was still alive. 2. Mixtures of air with one-twenty-fifth, one-twentieth, one-fifteenth of carbonic oxide were successively tried, but proved incapable of causing death in ten minutes. This result was obtained with one-tenth of carbonic oxide. After two minutes and a half the rabbit sank to the ground; at the end of four minutes it was seized with violent convulsions, and in seven minutes the fibrillar contractions in the muscles became general. The animal expired at the end of nine minutes. *Sulphuretted hydrogen:* 1. Air mixed with one-fiftieth of this gas was introduced into a vessel. The animal in it was seized with convulsions after forty seconds, and expired in two minutes. 2. One per cent. of sulphuretted hydrogen was employed in another experiment. After three minutes convulsions came on, and after five minutes the animal expired. *Sulphide of carbon:* 1. Some air was made to pass through a *carboteur* with sulphide of carbon by means of F. Gréhant's tube. The mixture of air and gas was introduced into a glass vessel. After a few minutes a rabbit was placed in it. At the end of two minutes it was seized with clonic convulsions amounting to a complete epileptic attack; in four minutes the convulsions became general; in six minutes they ceased. Death ensued in seven minutes. Another rabbit was placed in the vessel, and a rapid current of air, which had passed through a phial containing sulphide of carbon, was introduced. After thirty seconds the animal became agitated; after five minutes clonic convulsions appeared in the front and back limbs. At the end of seven minutes the convulsions continued, and increased until the animal expired, nine minutes after the commencement of the experiment. Ten grammes of sulphide of carbon had been transformed into vapor.

RESPIRATION IN UTERO.

Dr. J. E. Bergwall, a district physician in Sweden, reports in the *Eira* an instructive case which came under his observation in his official capacity, which shows that implicit reliance ought not to be placed on any lung test as a proof that a child has been born alive. A middle-aged married woman, who had already had two children, both of whom were stillborn, had complained of severe abdominal pain during the last few weeks of her third pregnancy. When labor commenced the midwife was sent for, and until she arrived an officious and ignorant neighbor took charge of the case. This woman, finding the cord prolapsed and the liquor amnii escaped, proceeded to tie the cord in two places and to cut it through between the ligatures. When the midwife arrived shortly afterwards, she found the two ends of the cord hanging out of the vulva, the os about the size of half-a-crown, the pelvis narrow, the membranes ruptured, and the fœtal head in the first position, but lying very high. The labor progressed satisfactorily for some time, but it was ultimately found necessary to have recourse to the forceps, which were applied about eight hours later, a well-developed female child being extracted,—dead, of course. There was a good deal of post-partum hemorrhage. The woman died in

two days from endometritis and perimetritis, notwithstanding the attendance of a medical man. The post-mortem examination of both bodies was made ten days afterwards by Dr. Bergwall. He found them in an excellent state of preservation. The remarkable thing was that the fœtal lungs floated readily in water, even when connected with the heart and thymus. The anterior and upper portions of the lungs were of a bright red color, and had an elastic feel, crepitating on pressure. The inferior and posterior portions were of a brownish color, with a few bright red spots here and there; these portions presented a firm feel, and did not crepitate on pressure, while pieces cut off from them sank in water. It was, therefore, evident that some amount of respiration had taken place in utero. No attempts at artificial respiration had been made. Before coming to the conclusion that the lungs contained air during life we should like to be quite certain that there was no putrefaction, seeing the long interval that elapsed between death and the post-mortem examination. Dr. Bergwall, for his part, is positive that the aeriform contents of the lungs were not due to putrefaction.—*Lancet*, December 1, 1888.

THE EMPLOYMENT OF PAPAYOTIN IN THE TREATMENT OF FISSURES OF THE TONGUE.

Dr. Schwimmer (*Revue des Publications Médicales*, December, 1888) has had recourse with success to the application of papayotin in cases of fissures of the tongue which had resisted the application of chromic acid, iodoform, and the nitrate of silver. He employs a solution of 1 or 2 parts of the papayotin to 10 parts of glycerin and distilled water, applying it five or six times daily to the fissures, which should be previously dried. He reports that he has seen twenty-four cases of cure out of twenty-five cases, and the latter, being of syphilitic origin, was ameliorated by the employment of specific medication.

HYSTERICAL AFFECTIONS OF THE THROAT.

At the meeting of the West London Medico-Chirurgical Society, held December 7, 1888, Dr. Scanes Spicer read a paper on some so-called hysterical affections of the throat (*British Medical Journal*, December 15, 1888). He said obscure and chronic paræsthesia of the throat, such as sensations of scraping, foreign body, burning, dryness, itching, causing dry, hacking cough, feeling of tension, constriction, ball rising in the throat, were often attributed to hysteria because no abnormal appearances were detected. Until recently no attention was paid to the pathological state of the tissues at the base of the tongue, between the circumvallate papillæ and the epiglottis, such as hypertrophy of the adenoid tissue called the "lingual tonsil," engorged veins, and an anteflected position of the epiglottis, conditions due, in his opinion, to chronic nasal and post-nasal catarrh, mouth-breathing, and carious teeth, producing irritating buccal secretions; improper use of the voice; indulgence in condiments, alcohol, hot drinks, and tobacco. They were also associated with anæmia, chlorosis, dyspepsia, gout, neurasthenia, rheumatism, and a congested portal system. As regards treatment, it was essential to remove nasal obstruction or catarrh, to adopt nasal respiration, to have carious teeth attended to, to keep the mouth rigorously clean, and to avoid the causes mentioned. Depletion of the portal system and salines were indicated, and the reduction of any nodules of adenoid tissue in the situation mentioned was essential. Gargles, sprays, and paints were inefficient; the porcelain galvano-cautery point should be used, the throat having been cocainized. If the nodules were large, a snare or knife and volsella might be used.

BORIC ACID IN INTERMITTENT FEVER.

For the last three years Dr. Bouchaloff (*Bulletin Général de Thérapeutique*, September 30, 1888) has been employing boric acid in doses of 5 drachms, once or twice daily, in the treatment of malarial fever. In the great majority of cases he claims that this remedy will completely replace quinine, although in certain cases he was compelled to resort to some preparation of quinine.

ESTIMATION OF ALBUMEN IN URINE.

A quick and ready method for the determination of the actual quantity of albumen present in albuminous urine has always been desirable. Hitherto the methods in use—except that of Esbach, which is, perhaps, open to some objections—were either too complicated in their manipulation, or else took up more time than can be generally afforded by the majority of practitioners. H. Zahor has, however, in the *Zeitschrift für Physiologische*

Chemie (12, 484–494), devised a simple process which gives results accurate to the first place of decimals, and which can be carried out clinically. It depends upon the difference in the specific gravity or density brought about in the urine by the elimination of the albumen. Such an estimation is termed a densimetric one. The method adopted is as follows: A preliminary examination of the filtered urine is made in order to determine approximately the amount of dilute acetic acid necessary to precipitate all the albumen when boiled. This is easily ascertained by taking a small quantity of urine in a test-tube, adding acetic acid, and boiling. The urine is then filtered from the coagulum, when the filtrate should yield no further precipitate with acetic acid and potassium ferrocyanide. A convenient quantity of the filtered urine, after the addition of the proper quantity of acetic acid, is then placed in a flask well fitted with a good cork. The flask, with its contents, is next placed for ten or fifteen minutes in a bath containing water constantly boiling. This brings about the precipitation of the albumen, which is then carefully filtered off into a flask fitted with a cork with a hole in it, through which the funnel is passed. It is advisable to cover the funnel during filtration with a glass plate. The density of the urine and the filtrate is then determined by means of a urinometer graduated to the fourth decimal place. Of course the temperature must be the same for both liquids. This precaution is easily taken by placing them in two glass cylinders immersed in a bath of water kept at a convenient temperature,—*e.g.*, 17.5° C. The difference between the initial density and the final density is then multiplied by the factor 400, the product giving the number of grammes of albumen present in one hundred cubic centimetres of the urine. The factor 400 is found to yield by experiment with a number of albuminous urines approximately accurate results, and depends upon the mean value of the specific gravity of albumen, which was found by the author to be 1.3747. It does not, however, appear to yield such good results with fluids containing albumen other than urine.—*Lancet*, November 24, 1888.

THE SULPHATE OF PHYSOSTIGMINE IN CHOREA.

Reiss has recently recommended in the *Journal de Médecine de Paris* for November 18, 1888, hypodermic injections of physostigmine in chorea, and relates a number of cases in which he has seen cure result after five or six days' treatment with hypodermic injections of $\frac{1}{64}$ of a grain of the sulphate of physostigmine injected twice daily. In aggravated forms of chorea, especially in adults, the treatment has not been so successful. He has also employed this method in tetanus, paralysis agitans, spinal sclerosis, post-hemiplegic chorea, and in a case of hysteria in a man, accompanied by great excitement and remarkable increase in the reflex movements; in all of these cases he claims that the results have been satisfactory.

FENWICK ON A NEW METHOD OF DRAINAGE IN SUPRAPUBIC CYSTOTOMY.

In the *Illustrated Med. News*, September, 1888, p. 2, Mr. Hurry Fenwick describes a new plan he has successfully tried in procuring efficient drainage, in cases of suprapubic cystotomy, where the patient is enfeebled by age or disease, and is liable to eczema or bed-sores from the continual soakage of the overflowing urine. The bladder is kept perfectly dry by means of slight suction (after the fashion of a Sprengel pump). An irrigating-can is placed upon a chair by the patient's bedside, and its tube, with a clip attached to regulate the overflow, is dropped into a chamber under the bed. The drainage-tube from the bladder is connected with the tube from the can, at an acute angle. A continual driblet of water from the reservoir falling into the chamber sucks the urine from the bladder as fast as it collects, and the patient is kept perfectly dry. Of course this plan would not answer if there be much mucocystitis or blood present. The author met with complete success in the case of an old man, aged 77, from whom he removed a stone two inches by one and a half inches in diameter. The case did well for a week, but a good deal of urine oozed out of the wound by the side of the tube, causing most distressing symptoms, which were at once relieved by using the suction apparatus. —*London Medical Recorder*, December 20, 1888.

JUMBUL IN GLYCOSURIA.

Mr. Geo. Mahomed publishes notes of a case in the *Practitioner* for December, 1888, in which the use of jumbul resulted in the diminution of the sugar in the urine, and at the end of a week in its entire disappearance. On discontinuing the drug the sugar returned,

and on resuming it it again disappeared. As the patient had no other treatment, and continued his ordinary (partially restricted) diet, the fact would seem established that the drug prevented the glycosuria. From the fact, however, that the specific gravity of the urine was only 1020, and no quantitative estimate of the amount eliminated apparently was made, it would seem that this was an extremely mild case.

CAUSE OF SPEEDY DEATH IN HEART-DISEASE.

At the meeting of the Clinical Society of London, held December 14, 1888, DR. OLIVER read a paper on this subject in which he drew attention to gastro-enteritis as a not infrequent cause of the rapidly fatal termination of cardiac disease (*British Medical Journal*, December 22, 1888). He gave a brief record of three cases out of seven or eight which had come under his notice within the last few years. The patients were all upwards of 30 years of age, were all men, and in none of them, either from the previous history or during the course of the illness, could anything be found likely to lead one to suspect that death would be induced by the setting up of a rapidly fatal form of gastro-enteritis. In all the symptoms were of an acute character; they frequently developed very quickly, and death, preceded by collapse, occurred either in a few hours or within a few days. The first symptoms complained of were pains over the region of the stomach and vomiting. Although aortic and mitral regurgitation were the forms of cardiac disease present in all his cases, Dr. Oliver was not inclined to exempt other forms of heart-disease from the tendency to end thus. Convallaria had been the drug taken during life by most of the patients; but as death from gastritis had occurred in some of his cases in which digitalis alone had been taken, while in others no cardiac tonic at all had been prescribed or taken, it was clear that convallaria, even in those cases where death had ensued, was not altogether to blame for the gastritis. The writer thought that heart-disease and gastro-enteritis stood in some obscure causal relationship to each other.

The PRESIDENT considered the society much indebted to Dr. Oliver. He thought this mode of death might be more common in cases of cardiac disease than was generally supposed. He would ask how far the post-mortem records of hospitals bore out Dr. Oliver's views?

DR. ANGEL MONEY said it was not rare to find the gastric mucous membrane covered with slime and red with points of vascular turgescence in cases of chronic heart-disease. He had noticed vomiting and chronic diarrhœa, with a perfectly clean tongue, in some cases of heart-disease.

DR. BARLOW thought that some of the most fatal cases which he had seen had been those in which the tongue was absolutely clean. He would have liked to have seen the state of the stomach in Dr. Oliver's cases. He himself showed a specimen removed from a child suffering from aortic and mitral disease, who had died from uncontrollable vomiting. After death there were found to be hemorrhagic ulcers in the stomach and duodenum, one of which had almost perforated. Often, however, nothing was found to account for the symptoms. He was not quite satisfied as to the accuracy of Dr. Oliver's explanation.

DR. MORISON inquired whether Dr. Oliver's patients had been subject to attacks of vomiting, or whether these were solitary attacks in the course of a long illness. He suggested that the vomiting was probably reflex and the congestion secondary, and doubted if death was due to the gastric condition.

DR. PERCY KIDD mentioned the case of a young woman, very anæmic, suffering from mitral stenosis, who had symptoms of gastritis, and whose symptoms had on several occasions been completely relieved by digitalis or strophanthus, given in small doses for a week or two.

DR. K. FOWLER asked whether any microscopical examination had been made of the heart muscular fibre. In a recent paper in the *Practitioner*, several cases of chronic heart-disease had been attributed to fatty degeneration of the cardiac muscular substance. Why was acute gastritis diagnosed in Dr. Oliver's cases?

The PRESIDENT said that in cases of long-continued blood-stasis from mitral disease the congestion of the viscera was great, and the vomiting that went with it was common enough; but such were scarcely cases similar to those described in Dr. Oliver's paper. It must not be forgotten, too, that embolism of the abdominal vessels was not rare in cases of heart-disease.

DR. OLIVER, in reply, said that the gastritis he had mentioned was not that of long-standing heart-disease. He had seen the stomach in many cases of that kind. In his cases the stomach was remarkedly red, inflamed in

patches, without there being much aortic or mitral regurgitation. Neither had the gastritis been caused by the drugs used; it appeared to come reflexly from the heart itself.

A VEHICLE FOR THE ADMINISTRATION OF THE IODIDE OF POTASSIUM.

In the *Boston Medical and Surgical Journal*, December 27, 1888, Dr. A. M. Blair recommends the administration of potassium iodide in milk. This, he states, will almost completely cover the taste of the iodide of potassium, and apparently in nowise interfere with its medicinal properties. He states that in cases where patients were unable to tolerate even 10 grains at a dose, when administered in a glass of milk they could very soon take 40 grains at a time without symptoms of nausea.

THE MILK-CURDLING FERMENT OF THE STOMACH.

Dr. E. G. Johnson has studied the action of the milk-curdling ferment of the stomach in the clinic of Professor Riegel, of Giessen, and subsequently in the Sabbatsberg Hospital, Stockholm. Researches were made in twenty-four cases on the presence of the ferment and the pathological conditions relative to it. Fourteen of these patients suffered from hyperacidity, accompanied in four of them by moderate dilatation of the stomach. In one of these latter there was also hypersecretion of the gastric juice. One case had considerable dilatation of the stomach, with hyperacidity and marked hypersecretion. In three cases the dilatation was insignificant, but there was hyperacidity, complicated in one case by slight, and in another by very great, hypersecretion; in the third case the hyperacidity was accompanied by chlorosis. Three other patients suffering from hyperacidity were also the subjects of gastric ulcer. Dr. Johnson also examined four cases of hyperacidity with neither dilatation nor hypersecretion, of whom three were chloratic; a case of catarrhal jaundice, four cases of severe chronic dyspepsia, and five cases of carcinoma of the stomach. The contents of the stomach were removed while the patient was fasting, and also four or five hours after food had been given for the purpose of the observations. Dr. Johnson sums up his researches as follows: 1. The milk-curdling ferment is a constant product of the glandular secretion of the stomach, and it is met with at all periods of digestion, except in cases of cancer of the stomach, in which it is never found. 2. The ferment was also found in the hypersecretions of the gastric juice of a fasting patient after his stomach had been washed out the previous evening. 3. Gastric juice which contains hydrochloric acid, and which when neutralized causes coagulation of milk, does not appear to be affected in its action by the greater or less amount of acid contained in it at first. 4. The milk-curdling ferment does not pass into the urine. 5. The ferment is easily destroyed by an excess of alkali, and it is probably on this account that it does not pass into the fæces under normal conditions. 6. During fever the ferment appears to be absent from the stomach. 7. The ferment causes coagulation more slowly in boiled than in fresh milk. 8. During the coagulation of milk by the ferment the reaction remains neutral, and lactic acid is not met with after coagulation.—*Lancet*, November 17, 1888.

CYANIDE OF ZINC IN CARDIAC AFFECTIONS.

According to Lashkewitsch (*Journal de Médecine de Paris*, November 18, 1888), cyanide of zinc exercises a favorable action in cases of palpitation of the heart, in pains in the cardiac region, in arhythmia from valvular diseases or disturbing cardiac neuroses, its action in the latter class of cases being especially marked. The author highly recommends this preparation in cases in which digitalis, convallaria, and other cardiac remedies appear to irritate the digestive track. The dose given is from $\frac{1}{12}$ to $\frac{1}{10}$ grain in the twenty-four hours.

ERGOT OF RYE IN THE TREATMENT OF POLYURIA.

The following remarkable results have been obtained by Dr. Bucquoy with ergot of rye in a case of simple polyuria. The patient was a man of robust constitution, who, after being nearly drowned five years ago, showed symptoms of polyuria and of severe polydipsia. After treatment with valerianate (?) during five months he recovered. At the beginning of 1888 polyuria reappeared. The affection was determined by violent grief. The patient passed from nine to fourteen litres of urine in the twenty-four hours. The density of the urine was 1004; its reaction was slightly acid; it contained neither albu-

men nor sugar, but 3.93 grains of urea per litre. M. Bucquoy administered seventy-five centigrammes (about twelve grains) of ergot of rye on the 14th of the month. The quantity of urine passed daily was then fourteen litres. On the 15th it was reduced to eleven litres; on the 16th to seven litres; on the 19th to seven litres; on the 20th M. Bucquoy reduced the dose of ergot to fifty centigrammes; the urine continued to diminish. On the 30th of the same month the treatment was suspended, but the quantity of urine diminished progressively. When the patient left the hospital he only passed from one and a half to two litres in the twenty-four hours. M. Bucquoy has observed the excellent effects of ergot of rye in other cases of polyuria of nervous origin. He has never obtained notable results with valerianate (?) even in large doses in the treatment of this affection.—*London Medical Recorder*, December 20, 1888.

THE INTERNAL EMPLOYMENT OF IODOL.

Dr. V. Martini has employed iodol in cases of chronic bronchitis and other chronic pulmonary affections in the hospital at Sienne, substituting it for the iodide of potassium; and has stated that the elimination of the iodide is slower, and its therapeutic effects are more persistent. This would therefore seem to indicate the superiority of iodol over iodide of potassium.—*Revue Générale de Clinique et de Thérapeutique*, November 8, 1888.

DANGER OF LARGE DOSES OF MALE-FERN.

Dr. Bayer, of Reichenberg, publishes in the *Prager Medicinische Wochenschrift* a case which has come under his observation in which very dangerous symptoms were produced by extract of male-fern together with extract of pomegranate. The patient was a woman of 26 years of age, who was suffering from tapeworm. She had been ordered by a medical man to take capsules, each containing 2.5 grammes of extract of male-fern, along with the same quantity of extract of pomegranate. She took three of these capsules. Early in the morning, at intervals of an hour, they produced severe sickness, and a portion of the tapeworm came away. As, however, the head did not come, the patient proceeded to take four more capsules, so that altogether she had taken seventeen grammes of each of the two drugs. These set up violent vomiting and diarrhœa, which continued till late in the afternoon, without, however, producing any further signs of the tapeworm. She then became exceedingly faint and prostrate, and in the evening fell into a comatose condition, in which she lay for thirty hours, notwithstanding continued efforts to arouse her. When at last she awoke, she found that her left eye was blind. When it was examined the next day, the pupil was found to be widely dilated, and quite inactive to light. The ophthalmoscopic examination revealed nothing abnormal; the pupil of the right eye reacted to light, but the acuteness of vision was diminished. After having been kept in the dark for forty-eight hours, the left eye was found to be sensitive to light, and, as the patient regained strength, vision gradually returned, and in a fortnight was nearly as good as ever. Dr. Bayer concludes that Gerhardt's advice never to give more than from 5 to 10 grammes of extract of male-fern should be rigidly adhered to.—*Lancet*, November 24, 1888.

HYDATIDS.

Dr. Juan Mercaut is stated to have succeeded in curing a case of hydatids of the thigh by irrigation of a six per cent. solution of boric acid, and three injections of ox-gall mixed with an equal quantity of lukewarm water.

TREATMENT OF GOITRE BY INJECTIONS OF TINCTURE OF IODINE.

M. Stoudentsky reports nine cases of goitre treated by injections of tincture of iodine, in which there was either complete disappearance or considerable diminution of the tumor. The author prefers Lugol's solution from the fact that it produces less pain. Injections may be made once a week with a hypodermic syringe, and should be very slowly performed.—*Revue Générale de Clinique et de Thérapeutique*, July 19, 1888.

A CORRECTION.

In the Therapeutic Gazette for August 15, in an abstract of a paper published by Dr. Schuchardt on the "Tonic Effects of Lathyrus Sativus" (*Deutsche Archiv für Klinische Medizin*, vol. xl. p. 312), the author's name was incorrectly spelled; it should have been as above.

—— THE ——

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PROPHYLACTIC HYGIENE.

LECTURE VI.—ON DISINFECTION.*

By Professor Dujardin-Beaumetz, Paris, France.†

GENTLEMEN:—In the previous lecture we had under consideration the subject of disinfectants. I shall tell you to-day how to utilize them; in other words, I shall speak of disinfection.

From the point of view which we occupy—*i.e.*, that of prophylactic hygiene—we shall have to study successively the disinfection of contaminated places, the disinfection of garments and bedding, then that of persons who have been in contact with the sick, and, lastly, the disinfection of the dejections. Let us begin with the disinfection of contaminated places.

Here we cannot avail ourselves of heat, the most powerful of disinfectants, unless we burn our houses down, which in times of epidemics has been done in some countries where dwellings are of little value. Hence we are obliged to have recourse to either gaseous or liquid disinfectants. The first are chiefly employed in France under the form of sulphurous fumigations; the second are in

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

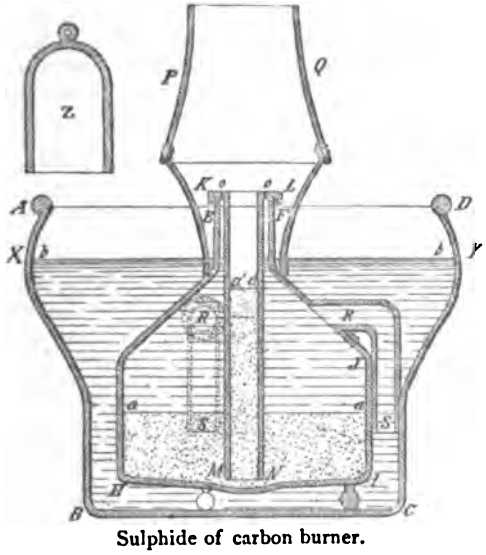
† Member of the Academy of Medicine, Physician to Cochin Hospital, etc, Paris, France.

usage in Germany, Austria, and Russia under the form of sublimate washings. Let us examine both methods.

As for the sulphur fumigations, you may, as I have shown in my communication to the Academy of Medicine,* employ three sources of supply of sulphurous acid,—sulphurous anhydride, sulphide of carbon, and burning sulphur. You are aware that Pictet, of Geneva, who is so good an authority on frigorific apparatuses, has utilized sulphurous acid rendered liquid by pressure. This substance, which has been described under the name *sulphurous anhydride*, is contained in charged bottles similar to the Seltzer-water siphon-bottles, and all you have to do is to press down the piston to give issue to a stream of liquid sulphurous acid, which boils at the ordinary temperature, undergoing transformation into the gaseous state. This is a handy way of obtaining sulphurous vapors, and if it has not been more employed in disinfection, it is because the siphon-bottles of sulphurous anhydride are relatively costly.

When sulphide of carbon is burned, sulphurous acid and carbonic acid are set free. Ckiandi-Bey, one of the engineers who is particularly interested in all questions relating to sulphide of carbon, has constructed a very ingenious lamp, which I here place before you (Fig. 1), and which enables us to burn sulphide of carbon without any danger. In fact, in this burner, the water contained in a copper receptacle, A, B, C, D, enclosing the lamp, I, H, E, F, penetrates by three siphons, R, S, in the interior of the latter, and comes in contact with the upper part of the sulphide of carbon, which it replaces as fast as it is burned. When all the sulphide of carbon has been consumed, the water penetrates the wick in its turn, and the lamp is extinguished. These lamps have been chiefly utilized by the marine department, which has derived advantage from them in the sulphurization of sailing-vessels; and, setting aside the first cost of the lamp, the expense of disinfection by sulphide of carbon is relatively trifling, and does not exceed twenty-five cents for a room of one hundred cubic metres.

FIG. 1.



Sulphide of carbon burner.

You may also employ sulphuretted hydrogen, which by its combustion furnishes sulphurous acid and water, and in the experiments which I have made with Dariex in treating pulmonary tuberculosis by inhalations and hypodermic injections of sulphurous acid, we employed a sulphuretted hydrogen burner devised by Chantrelle; but the liberation of sulphuretted hydrogen diffuses a disagreeable odor, and, this gas being toxic, this method cannot be made applicable to disinfection. It remains for us now to consider disinfection by sulphur fumigations.

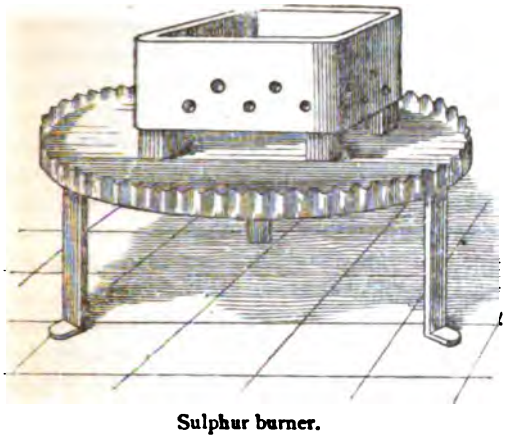
You must, first of all, remember that fifteen grammes of sulphur in burning evolve ten litres of sulphurous acid. We make use, in most cases, of the flowers of sulphur, and, as the quantity to burn varies between thirty and forty grammes per cubic metre, it is essential that you should know how to burn this sulphur to the best advantage. When the apartment is gauged into cubic metres, you divide the quantity of sulphur necessary for the disinfection into several lots, so as not to exceed one kilogramme of sulphur per lot. To burn this sulphur, you can make use of a fire-proof clay box pierced with holes like the one which I here show you (Fig. 2), and which rests on a plate of sheet-iron, or you can extemporize with bricks and sand a suitable trough for the purpose. Lastly, to kindle your sulphur over its entire surface, you can do as Pasteur advised us to do when we made our experiments, pour a little alcohol over the sulphur before setting it on fire.

To-day we can make use of a still simpler method,—*i.e.*, employ the sulphur "bougies" devised by my pupil Deschiens. For the disinfection of apartments, he has constructed a huge lamp, consisting of a tin box full of melted sulphur; a large wick occupies the centre of this box and enables one easily to

* Dujardin-Beaumetz, "Experiments on the Disinfection of Places which have been occupied by Persons Sick with Contagious Affections" (*Bull. Gén. de Thèr.*, t. cvii. p. 241).

light the lamp (Fig. 3). As I have already told you, the disinfectant value of sulphur is largely proportional to the closeness of the room undergoing disinfection, and it is necessary not only to shut the windows and doors, but to stop all the chinks and crevices. Yet,

FIG. 2.

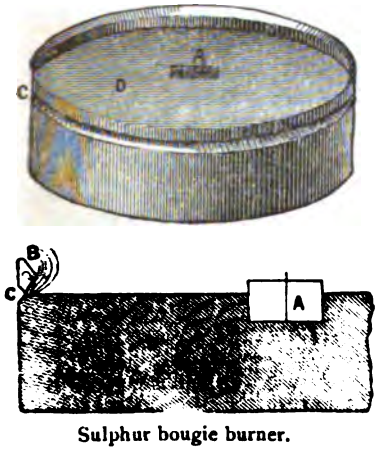


Sulphur burner.

despite all your care, you will never prevent this gas from escaping, by reason of its extreme diffusibility. It is, then, only by pasting paper around the windows, by stopping up the chimneys, and making tight the doors that you can get good results from these sulphurizations of contaminated places.

The sulphur fumigations have this advantage, that you can leave in the apartment all furniture, and in particular the bedding, sulphurous acid having a considerable force of

FIG. 3.



Sulphur bougie burner.

penetration, and permeating even the interior of mattresses. In our experiments, and in those made by Dr. Aubert, it was demonstrated that there is scarcely any alteration of the textile fabrics: only the metallic objects may become tarnished; this may, however, be prevented by covering them with a layer of vaseline.

To render the disinfection more active, Vallin has proposed to charge the air of the room with moisture by sprinkling the floor of the apartment with water, or by passing a wet sponge over the walls, or by boiling water in the room. I believe this an excellent procedure from a disinfectant point of view; unfortunately, it has the disadvantage of discoloring the objects in the room, for not only does the sulphurous acid dissolve in the water, but some sulphuric acid is also generated.

As for the quantity of sulphur to burn, this varies with the tightness of the room to be disinfected. When there are not too many ventilating chinks, and such as exist can be easily stopped, the quantity of forty or fifty grammes per cubic metre should suffice. When, however, it is difficult to make the room tight, you must double this quantity, and even in this case you are not sure of having thorough disinfection. After the sulphur has been set on fire, you quit the room, and for twenty-four hours, at least, you leave it shut up, after which you proceed to a careful washing and scrubbing of the apartment.

In concluding what I have to say under this head, I am going to read to you the order of service which M. Bezanson, ward superintendent to the prefecture of police, and myself had printed for the benefit of the squads of disinfectors employed for the city of Paris; these rules will sum up in definite shape the main points which I have just furnished you.

ORDER OF SERVICE FOR THE CORPS OF DISINFECTORS.

The service of disinfection at the patient's house, after his transportation to the hospital or after his decease, shall commence at seven o'clock in the morning, and cease at 7 P.M.

The chief of the station shall see that all the men are present at the regular hour. He shall report to the prefect those who are tardy, and, in a general manner, those who do not conform to the instructions and orders given. He shall take care that the utensils and implements put at the disposal of the squads shall be employed regularly, and he shall keep a strict account of all that come in and all that go out.

The chief of the station shall take pains to see that the wagon before starting out is provided with the following objects and disinfectant materials:

1. A plate of sheet-iron sixty centimetres by sixty;

2. A bag of sand;

3. Sulphur in packages of five hundred grammes;

4. Methyl alcohol (wood spirit) in bottles of two hundred grammes;

5. Fire-pots of earth or of brick;

6. A quantity of matches;

7. A quantity of shavings;

8. A metre measure;

9. A short ladder (about two metres);

10. A pot of glue and a brush;

11. A lot of paper for pasting over walls, etc. (old newspapers, for instance);

12. Some bottles of chloride of zinc.

When the signal for departure is given, the superintendent will place in the hands of every man belonging to the corps a card on which is written his name, the hour of departure, and the number and street of the tenement to be disinfected.

The wagon will set out immediately, and reach this place by the most direct route.

On arriving at the place of destination, the squad will present to the master of the premises their cards of service, and will repair to the room to be disinfected: it is always proper to ask some member of the family to assist in the work of disinfection. They will then proceed to their work according to the following instructions:

Take the dimensions of the room, measure the length, breadth, and height, multiply the first by the second and the product by the third. This measurement is taken in order to determine what quantity of sulphur should be burned in the apartment. This should equal twenty grammes (three hundred grains) per cubic metre (1.3 yard); thus, a room of twenty-five cubic metres will require a package of five hundred grammes.

Place on the floor or on tables all the objects which have been in contact with the cholera patient. Stop up the chimney, and close the windows and doors, pasting paper over all crevices.

Arrange on the plate of sheet-iron placed in the middle of the room the fire-pot or the bricks, taking all possible precautions against setting the building on fire; all papers and textile fabrics should be removed. In default of a suitable fire-pot, form, by means of bricks and sand, a sort of shallow basin of about thirty centimetres by thirty, into which the necessary quantity of sulphur shall be poured; moisten the surface of the sulphur with a little alcohol; throw over it a few shavings, and set it on fire. Do the same with the fire-pot if you have one.

Close the door of the apartment. Make tight the outside door; give the key to the keeper, with orders to allow no one to enter.

Before leaving the house do not fail to throw into the sinks and privies a solution of chloride of zinc, five hundred grammes (sixteen ounces) to ten litres of water (ten quarts). The operation having been finished, the disinfectors will see that a note is made on their card of service by the keeper of the house or one of the members of the family of the hour of their arrival and departure.

The corps of disinfectors will then return by the most direct route to the central station. The superintendent of the station will write on the card of service the precise hour of the return of the disinfectors to their post, and will keep this card.

The next day, the squad will return to the premises which they had disinfected the day before, open the doors and windows, throw a fresh quantity of chloride of zinc solution (5 per 100) into the sinks and privy-vaults, and bring back their utensils to the station. The men are absolutely forbidden to quit their post under any pretext whatever without permission of the superintendent of the station.

The disinfectors and the drivers are forewarned that any irregularity or negligence in the execution of their service will be severely punished. The employé who does his work badly, or who becomes intoxicated, may be deprived of his wages, or even immediately dismissed from service.

This is the way disinfection is practised in Paris.

In Germany, in Austria, and in Russia the sulphurous fumigations have been completely abandoned, and the authorities depend on corrosive sublimate for the disinfection of contaminated places. We will, if you please, take as an example of this second mode of disinfection the method which now prevails in the city of Berlin, where they have established for the first time a public disinfecting station, and we will follow the very faithful description which has been given of it by Dr. A. J. Martin.*

I will omit for the present all that pertains to the central disinfecting station, where are brought the bedding, tapestry, and clothing for disinfection. I shall return to this subject presently. I am now concerned only with the

* A. J. Martin, "Le premier établissement public de désinfection de la ville de Berlin" (*Revue de Hygiène et de Police Sanitaire*, 1888).

disinfection of houses, and we shall be able to contrast the order of service which I have just read you with that which is put in practice by the disinfectors of Berlin.

The first parts of these two orders are similar; that is to say, the men who go in the covered wagons receive a card of service numbered, the exact hour of departure and the route to be taken being marked down. The disinfectors take with them the following objects:

1. A mask or face-protector lined with antiseptic wadding;

2. A wire basket with three compartments holding a large bottle and a spray apparatus: the bottle contains a disinfectant liquid;

3. A case containing implements and brushes;

4. Linen sacks of different forms to hold objects to be removed from the building: these bags have each a number worked into them with red cotton.

The disinfector, for one man here does the work, makes bundles of all the objects found in the room. He burns things of little or no value; then he scrubs the floors, walls, furniture, windows, and doors with brushes and sponges soaked in a 1 per 1000 solution of sublimate. As for the metallic objects, he rubs them over with vaseline, and subjects them to fumigation with chlorine. The objects placed in bags are put into the covered wagon and carried to the disinfecting station, where they are subjected to the action of high heat.

The disinfectors are obliged to take the utmost pains in personal cleanliness. When the disinfector enters the apartment where he is to operate he puts on a long linen cloak, which, after he gets through with his work, is brushed and cleansed with a carbolic solution; this cloak is worn only in the contaminated dwelling, and before leaving the latter the disinfector makes a special bundle of it. Just before making up into packages the objects which are to be conveyed to the hot-steam room, the operator places over his face the mask lined with wadding; this is removed and burned after the completion of the disinfection. Lastly, every evening, at the end of the day's work, which lasts from seven in the morning to seven at night, the disinfector takes a bath, and washes with great care his hair and his beard.

As you see, disinfection in Berlin consists of two parts,—first disinfection of the room, then of the clothing, carpets, and bedding, and all textile fabrics that have been in contact with the patient.

As far as disinfection of rooms is concerned, it may be demanded if the thorough washing with a sublimate solution (1 per 1000) of the walls of the apartment is really practicable, since the wall-papers are sure to be injured thereby? Certainly, if the process seems applicable enough when you have painted surfaces to deal with, it is objectionable in the case of papered walls, unless you remove and destroy the paper.

In the hospitals of St. Petersburg, which I have just visited, I have seen put in practice these processes of disinfection, as in the Alexander hospital-barrack, one of the models of the kind, which we would do well to copy after in any similar establishment which we may hereafter construct. In this hospital there is a physician who has the charge and sole responsibility of the service of disinfection, which pertains at once to the clothing, the bedding, and the wards. As for the latter, the solution of sublimate above mentioned (1 per 1000) is used, and by means of a hand-pump similar to those used in our gardens the walls and ceiling of the apartments are covered with the solution. But, I repeat, the walls are painted, and their surface is perfectly smooth, while, on the contrary, in our apartments, and especially in the rooms occupied by the poor population, it is not so; and I do not see how you are going to have thorough disinfection of these rooms without sacrificing the wall-papers.

However, we are intending to make trials here in Paris of this mode of disinfection, and we shall then be able to judge for ourselves which are best, the gaseous fumigations or the sublimate washings.

Therefore, to sum up,—in the present state of our knowledge, I would say, whenever the circumstances permit have recourse to sublimate solutions, and make your cleansing as thorough as possible. Whenever, on the contrary, your washings with sublimate cannot be thoroughly done, make use of the sulphurous fumigations, taking care to have the room as tightly closed as possible.

Thus far we have been concerned only with the disinfection of contaminated houses when these places have been evacuated; can this disinfection be carried out when these habitations are occupied by the patients? It must be admitted that under such circumstances disinfection becomes difficult and is likely to be disappointing. At the same time, in cases where you have to do with diseases

which are eminently contagious, like small-pox and diphtheria, it has been recommended, in order to prevent the transmission of contagion from the patient to visitors and attendants, that the room should be sprinkled with disinfectant substances, or that these should be kept in open vessels by the bedside of the patient. These are methods to be utterly abandoned, for they are of no worth; they impregnate the air of the room with odors injurious rather than beneficial. What is worth far more, while being yet of doubtful utility as far as the end in view is concerned, is spraying with antiseptic liquids, such as solutions of carbolic acid, thymic acid, or of antiseptic mixtures, one of the most active of which is Penne's Antiseptic Vinegar, of which the following is the formula:

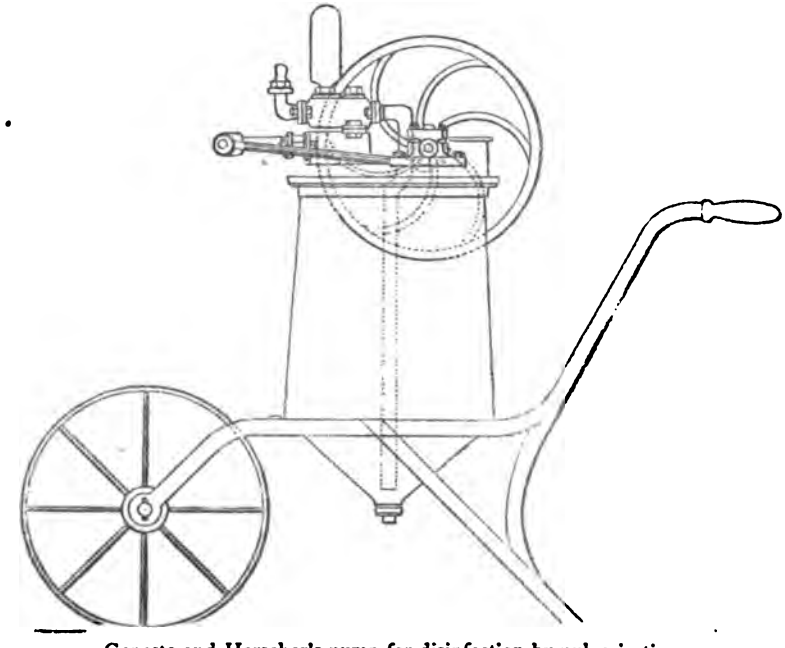
Salicylic acid, 30 parts;
Acetate of aluminium, 30;
Alcoholate of eucalyptus globulus, 600;
Alcoholate of verbena, 100;
Alcoholate of lavender, 100;
Alcoholate of benzoin, 100;
Acetic acid, 100. M.

To make these pulverizations we use the large spray atomizers employed in surgery.

As for garments and objects of bedding, all are agreed in acknowledging the superiority of heat, and if there is still any disputation, it is not with regard to the principle itself, but the apparatus to be employed in order to obtain from the heat its maximum of disinfectant power; and this brings us to the subject of disinfecton-stoves.

Many models have been proposed, but if you recall to mind what I said in the last lecture, you will understand that the only kinds which should be employed are the stoves for steam under pressure, and that henceforth we ought utterly to discard the hot-air stoves, as well as those for overheated steam, and, in general, stoves for hot air and steam without pressure. The type of these stoves for steam under pressure has been furnished by Geneste and Herscher. These are the stoves which are now placed in our hospitals, and you can see the working of one of them in this hospital (Cochin). The figure which I now show you (Fig. 5) sufficiently indicates the principle on which these stoves are constructed. This stove consists of a metallic cylinder, 1.30 metres in diameter, into the interior of which a car is rolled over an iron track, on which car are placed the objects to be disinfected. This cylinder is closed and made air-tight by means of two doors, one at each end. By the side of this apparatus there is a boiler that furnishes the steam, which penetrates the stove by tubes, some of which are tight, enabling the operator to raise the temperature of the stove and keep it at 130° C.; the others are pierced with holes forty millimetres in diameter, which let the steam escape at a given moment.

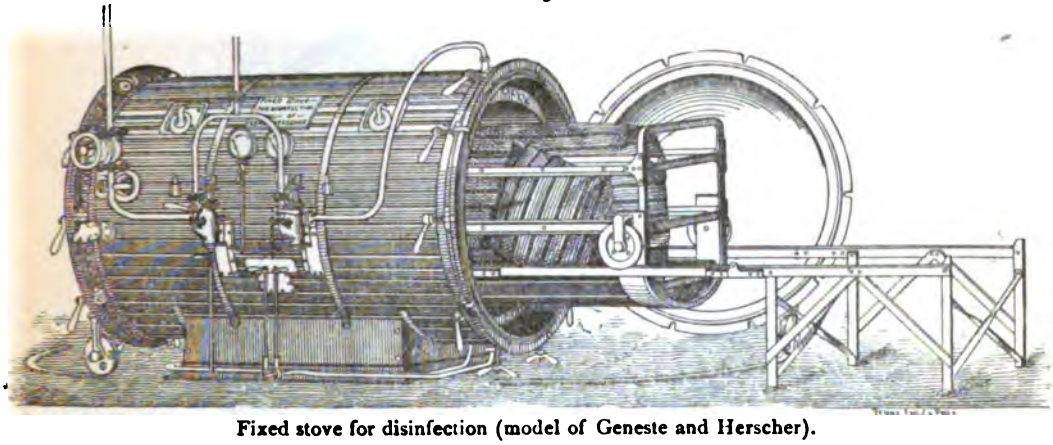
FIG. 4.



Geneste and Herscher's pump for disinfection by pulverizations.

The description which I have just given applies to the fixed stoves, but this arrangement may be varied according to circumstances, and one of the most useful modifications is that which consists in making these stoves portable. The figure which I here show you (Fig. 7) gives you an idea of this portable stove. A locomotive boiler furnishes the steam under high pressure. By means of this useful apparatus we may now disinfect on the spot infected objects, and in the recent epidemic of *sweating sickness* (*suette miliaire*) which prevailed in Poitou, these portable stoves were employed with great success. Several of these stoves have been recently assigned to the various cantons of the department of the Seine to help in stamping out the epidemics now prevailing there.

FIG. 5.



Fixed stove for disinfection (model of Geneste and Herscher).

It may be asked from an economical point of view if these stoves do not injure the clothing and other objects subjected to disinfection?

The very complete report of Vinay gives a decisive answer to this question.* His very careful and thorough experiments have shown that the injury received by the objects placed in the stoves is extremely slight. Only when the clothing is soiled by fæcal matters and by blood there remain indelible stains. Hence Vinay advises a previous washing of all soiled clothing before disinfecting, and for this purpose he makes use of water containing a little permanganate of potash in solution.

As for the rapidity of the disinfection, it is very great, for at the end of fifteen minutes of subjection to the heat of these stoves all the pathogenic microbes are destroyed. But if objects of wool, cotton, and linen can stand the action of steam under pressure, it is not so with animal substances used for wearing apparel, such as shoes, gloves, and furs. It is curious to observe the effect of these stoves on gloves or shoes: they shrivel up, and to such a degree that they will no longer fit on to the hands or feet of any one unless it be a young child; hence, for these common articles of raiment you must have recourse to other processes.

In Germany and in Russia, where fur is so necessary a part of the wearing apparel, they make use of fumigations of chlorine and solutions of carbolic acid. In France we employ either chlorine or sulphurous acid. I need not go back again to the subject of sulphurous acid, concerning which I have already said enough, and shall complete what pertains to the disinfection of garments by a brief mention of chlorine.

Chlorine may be obtained either by the action of hydrochloric acid on binoxide of manganese or from chloride of lime. The method ordinarily adopted by the hospitals is that which was proposed by Professor Regnault,† as one which gives the best results for the disinfection of objects of bedding:

> Dry chloride of lime, 500 grammes;
> Hydrochloric acid, 1000 grammes;
> Water, 3000 grammes.

In an earthen basin you mix the acid and the water, and just as you are about to leave the room you throw in the chloride of lime; you thus set free about forty-five litres of chlorine. But the most advantageous method is to introduce chlorine by means of a tube into the room previously hermetically closed.

* Vinay, "On the Practical Value of Disinfection-Stoves." Lyons, 1887.

† *Traité de Pharmacie*, 1875.

Hence, in all the establishments of disinfection which exist in Germany and France, it has been found necessary to supplement the hot-steam disinfection stove by a room in which chemical disinfection is practised, and the figure which I here place before you gives you a good idea of the arrangement which has been adopted for carrying out this chemical disinfection (Fig. 8).

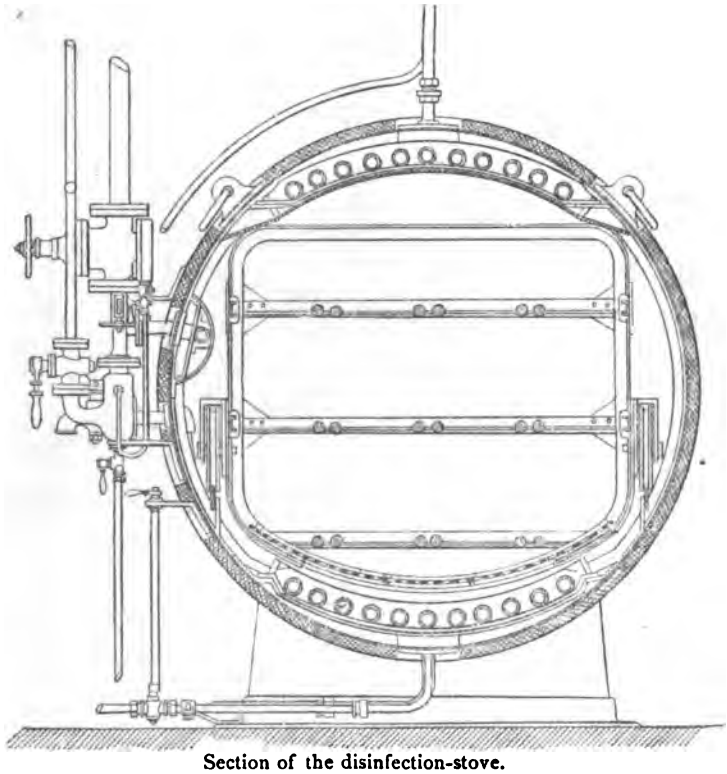
Now that you know the mode of disinfection of objects of bedding and garments, I ought to say a few words about the way to put it in practice, and here there are three circumstances to be taken into consideration; either you have to do with a hospital, a large city, or a commune district.

As for hospital disinfection, I must again refer you for a model to the manner of disinfection at the hospital Alexander at St. Petersburg. As soon as a patient enters the hospital, in the reception building, and before he is admitted to the wards, he is deprived of his garments and takes a bath. His clothing is then transported in a covered wagon to the disinfecting hall. The furs and shoes are placed in a fumigation apartment, where they are subjected to the action of chlorine, and where they remain forty-eight hours; the other articles of raiment are disinfected in the hot-steam chamber. Then, when the disinfection is complete, all the objects are removed to a ventilation room, where they are thoroughly aired in draughts admitted through openings in the walls. The disinfection of bedding, linen cloths used in dressings, etc., is always effected in the stove.

As for the large cities, there is a tendency to institute public establishments for disinfection, and Paris will have no cause to envy other cities in this respect, thanks to the efforts of the Municipal Council, which is about to establish two public disinfecting stations, the one on Vannes Street, No. 160, the other on Récollets Street. Berlin, which has a very complete service of disinfection, has effectively equipped the building set apart for that purpose, and the admission of all infected objects takes place through a special court, distinct from another court through which all disinfected objects pass out; different tracks are used in both cases. There is but one fault to find with this establishment,—namely, the stove employed, which is very inferior to that constructed by Geneste and Herscher, especially as far as the rapidity of disinfection is concerned.

As for the commune districts, disinfection

FIG. 6.



Section of the disinfection-stove.

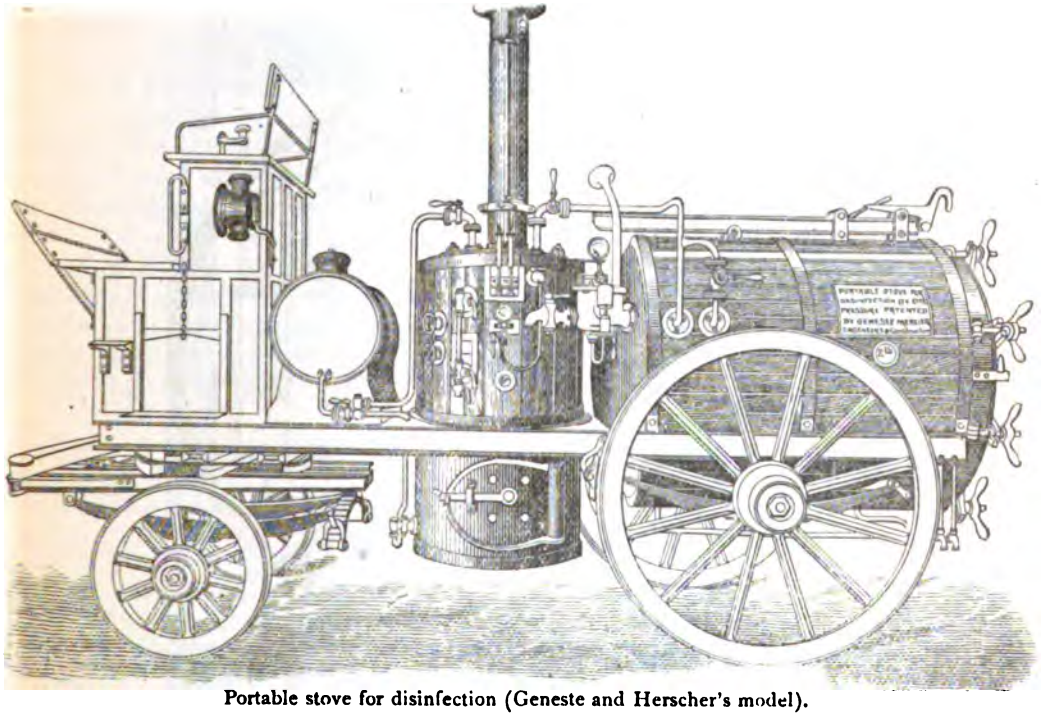
may be carried out by means of the portable stoves, and I have already told you that in the recent epidemic of *suette miliaire* which has prevailed in Vienne and Haute-Vienne these stoves have been put in usage, and have rendered good service. But these stoves are hardly suitable for use except in grave epidemics, and in contagious diseases of medium intensity it is better to have recourse to other means. In these cases you can only employ washings with sublimate, 1 per 1000, with cupric sulphate solutions, or the fumigations. It is for the sanitary officer to decide which one of these means he will employ, choosing that which seems best adapted to the occasion. I come now to a more difficult subject, that of the disinfection of persons.

There is no doubt that persons who have been in contact with patients affected with infectious diseases may be the conveyers of contagion. The skin or the garments may be a lodging-place for pathogenic microbes, which, transported to an individual in a fit state of receptivity, may engender disease. Such facts have been recorded with reference to scarlet fever, smallpox, and other specific fevers; they have also been noted in connection with diphtheria, as the very convincing observations of De Cresantignes go to show.*

But surgery and obstetrics have given us the most positive proofs of this conveyance of contagion, and it is to-day admitted without dispute that in a great number of cases it is the surgeon or the accoucheur who is oftenest responsible for the septicæmia of the wounded or of the puerperal patient. In this connection permit me to allude to the curious experiments of Kümmel, who, by plunging the hands into gelatin, observed how thorough was the washing required to render the hands absolutely aseptic. He has shown that there are hands which cannot be got clean, and which, despite all the care, always give rise under such circumstances to colonies of microbes. These experiments seem to explain the success or want of success of certain surgeons; I shall return to this point presently when I come to speak of the disinfection of the hands and of instruments.

In fact, the disinfection of persons comprises the disinfection of the clothing and that of the skin. To effect the first, it was formerly the custom to place the individual to be disinfected in a fumigation-box, where, the head only being allowed to protrude, the whole body was brought into contact with chlorine or sulphurous vapors. This process is now carried out at the Royal

FIG. 7.



Portable stove for disinfection (Geneste and Herscher's model).

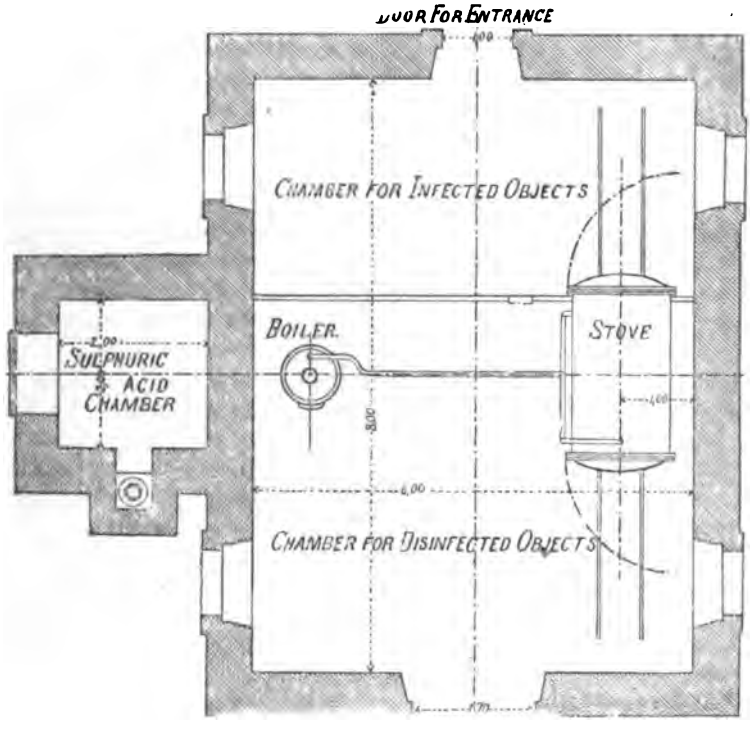
* De Cresantignes, "Contribution to the Etiology of Diphtheria Contagion by the Intermediation of a Healthy Subject" (*Bulletins et Mémoires de la Société de Médecine pratique*, July 5, 1888, p. 505).

Maternity of Copenhagen, also in the smallpox hospitals of Switzerland, Germany, and Italy.

But such practices are very difficult of execution, especially in our hospitals, where the medical staff is quite large. Hence the disinfecting cabinet has been for the most part given up, and our hospitals have adopted the usage of a special suit of clothes for the infected wards, and in particular of a long linen robe, and it is made obligatory upon the medical staff, in hospitals set apart for smallpox or other contagious diseases, that they shall never go outside the hospital wearing the same clothes that they wear in the hospital.

teria, and that what is needed is a thorough washing of the hands with the help of the brush for three minutes with warm soapsuds, then for one minute with carbolized water (five per cent.), to destroy the microbes. The results of these experiments have been confirmed since then by Gaertner and Forster. But when the hands are infected by the performance of an autopsy these precautions are not sufficient, and this is what one ought to do to rid his hands of all micro-organisms: scrub with the brush for five minutes with black soap and warm water, then for two minutes (still using the brush) with a mixture of equal parts of chlorine-water and dis-

FIG. 8.



Plan of a building for disinfection.

As for the care to be taken to disinfect the person, this consists in baths, and frequent washings of the face and hands. It should be required that the beard shall be always clipped short, and that the head shall be almost shaved. At any rate, the utmost pains should be taken in cleansing the hair and the beard. But it is to the disinfection of the hands that attention has been especially directed. In his experiments, Kümmel has shown that cleansing the hands with the brush for five minutes with soap and warm water and scrubbing with boiled water never prevent the development of colonies of bacteria, and that what is needed is a thorough washing of the hands with the help of the brush for three minutes with warm soapsuds, then for one minute with carbolized water (five per cent.), to destroy the microbes. The results of these experiments have been confirmed since then by Gaertner and Forster. But when the hands are infected by the performance of an autopsy these precautions are not sufficient, and this is what one ought to do to rid his hands of all micro-organisms: scrub with the brush for five minutes with black soap and warm water, then for two minutes (still using the brush) with a mixture of equal parts of chlorine-water and distilled water, or with a 1 to 20 carbolic solution. But the nails always give the most trouble and demand the most care in cleansing, and they should always be kept cut very short.

Jules Roux and Reynés have lately made some interesting experiments (*Acad. des Sciences*, November, 1888). After successive scrubbings they cleaned out, by means of a sterilized wire, the sub-ungual space, and sowed the products on gelatin or agar-agar. No washing or scrubbing of the hands with warm water and soap, followed by carbolic water (ten per cent.), prevented under these

circumstances the development of micro-organisms. To accomplish this it was necessary to do as Furbeinger recommends. We quote his directions:

"1. Dry-scrape the nails and the sub-ungual space;

"2. Wash and brush with hot soapsuds a minute at least;

"3. Wash and brush with alcohol at 80° for the same time;

"4. Before the complete evaporation of the alcohol make a final cleansing with the antiseptic solutions, using again the nail-brush."

According to Furbeinger, when these precautions have been taken, the scrapings of the sub-ungual space have always been sterile. Roux and Reynés, however, have obtained less favorable results, complete asepsis being realized in only fifty to eighty per cent.

To obtain antisepsis of the skin, solutions of permanganate of potash have also been proposed. We are indebted to Danlos for the suggestion to wash the hands in a 5 per 1000 permanganate solution. The brown discoloration caused by this solution can be removed by soaking the hands in a solution of bisulphate of sodium, 1 to 5. Antiseptic soaps have also been advised, and antiseptic aromatic lotions; here are some of these formulæ as given by Helot:

ANTISEPTIC SOAP.

Boric acid, 15 grammes;
Crème de Savon of the perfumers, 90 grammes. M.

AROMATIC LOTION.

Acid thymic, 1 gramme;
Alcohol at 90°, 4 grammes;
Distilled water, 1000.

Mollard has made sulphurous acid soaps; others soaps with carbolic acid, thymol, etc.

Such are the general rules applicable to the disinfection of persons. You ought to insist on these rules being carried out by nurses or members of the family who are in direct contact with the patient. You will tell them to wash their hands whenever they touch the patient or handle his dejections, using for this purpose solutions of sublimate or thymol, 1 to 1000; you will enjoin on them the necessity of not merely keeping the hands and the nails scrupulously clean and aseptic, but also of frequently washing the face, the hair, and the beard; they should, moreover, often take full baths; you will forbid them to eat and drink in the room of the patient; lastly, you will prohibit them from going out with the same clothing on that they wear in the sick-room. It only remains for me now to speak of the disinfection of dejections, a matter of some importance.

Since bacteriological research has revealed the presence of pathogenic microbes in the dejections, the necessity of thorough disinfection of these dejections has become one of the most important points of prophylactic hygiene. There are two diseases in particular where the contagion is propagated almost exclusively by the excreta.—typhoid fever by the fæcal matters, and pulmonary tuberculosis by the expectoration.

As Vallin has said in his remarkable report on the contagion of tuberculosis, we are warranted in affirming that the products of expectoration are unquestionably the principal agent in the transmission of tuberculosis. There is, then, an urgent demand to destroy the virulence of these sputa.

If you will refer to the experiments of Schill and Fischer, you will see that these sputa, especially in the moist state, present an extreme resistance to our agents of disinfection, and only heat is the sure means of destruction of these virulent products.

Yersix affirms that the bacilli of tuberculosis (sporules or bacteria) are destroyed when they are subjected to a temperature of 70° C. for ten minutes. I believe that in practice this temperature ought to be considerably higher, and raised to at least 100° C.

It is very difficult to carry out this disinfection of sputa. In order to succeed, you must forbid the patients to expectorate on their handkerchiefs, napkins, or on the ground, and you must insist on their expectorating in their spittoons. These should be furnished with saw-dust, which may be kept moist with any one of the following mixtures recommended by Vallin, although the destructive action of these antiseptic preparations on the bacilli of tuberculosis is not equally demonstrated with respect to each one of the series:

1.

Chloride of zinc (liquid at 45°), 100 grammes (3.2 ounces);
Glycerin and water, 1 litre (1 quart).

2.

Chloride of lime, 50 grammes (1.6 ounces);
Water, 1 litre (1 quart).

3.

Crystallized phenic acid, 5 grammes (77 grains);
Water, 900 grammes (1 pint, 14 ounces;
Glycerin, 100 grammes (3 ounces, 3 drachms).

4.

Crystallized thymic acid, 2 grammes (30 grains);
Alcohol, 50 grammes (1 ounce, 5 drachms);
Water, 900 grammes (1 pint, 14 ounces);
Glycerin, 50 grammes (1 ounce, 5 drachms);
Crystallized sulphate of copper, 50 grammes (1.6 ounces).

5.

Nitric acid, 50 grammes (1.6 ounces);
Water, 850 grammes (1 pint, 12 ounces);
Glycerin, 50 grammes (1 ounce, 5 drachms).

Then, at the end of the day, you will destroy more completely the virulence of the sputa by emptying the contents of the spittoons into the fire, which is the most radical means, or by subjecting them to boiling water or to steam. Two sorts of apparatus are actually in usage to attain this end: the one, devised by Dr. Lallier, utilizes a jet of steam from the steam-boiler of the establishment; the other, constructed by Geneste and Herscher, accomplishes the thorough cleansing and disinfection of the spittoons in a vat by means of a jet of boiling water made to play upon them for about five minutes; this is done in a little kitchen adjoining the ward. Smaller apparatuses constructed on the same plan may be employed in private families.

The problem is still more difficult when the disinfection of fæcal matters is to be effected, and we here come to one of the most grave questions of prophylactic hygiene.

Hitherto most of the means advised for the disinfection of fæcal matters have consisted rather in a deodorization of those matters than in a destruction of their morbid germs. Thus it is that peat and earth have successively been proposed; sulphate of iron has been oftenest used, and this salt is especially indicated in the orders of the prefect of police given with reference to the disinfection of dejecta. The proportion ordinarily called for is five kilogrammes of ferrous sulphate to each cubic metre of matters to be disinfected. At Lyons, the heavy oils of coal are much lauded; these oils seem to have a much more decided microbicide action than the ferrous salt above mentioned.

But here, also, heat is much the most effective agent, and you may by the aid of steam under pressure absolutely destroy the virulence of fæcal matters. I saw at St. Petersburg, at the hospital-barrack Alexander, a very ingenious apparatus constructed according to the directions of Dr. Wassilieff, in which all the fæcal matters were subjected in a continuous manner to the influence of high-pressure steam. This apparatus has been employed chiefly in cholera and typhoid fever, and there is the greater necessity for something of the kind at St. Petersburg from the fact that this city has no sewers, and all fæcal matters ultimately find their destination in the soil. In Paris during the epidemic of 1884 Durand-Claye and Masson attached to the Marine Hospital an apparatus which subjected to intense heat (in fact, *cooked*) all fæcal matters before they were delivered to the sewer.

But such a disposition of excreta as this can be applicable only to particular cases, and cannot become of general availability, as in the case of large bodies of people. Other means of disinfection have, therefore, been sought, and for the large cities it has been proposed to subject all fæcal matters to chemical changes which shall transform them in large part into ammonium sulphate, or even to make use of the soil as a means of disinfection.

I cannot here enter into this great question of sewerage, a social and hygienic theme which would require many lectures to deal thoroughly with. I can only indicate the general outlines of the subject.

The sewerage system may be referred to three principal types. In the first, or "depository" system, to-day condemned by all hygienists, the sewage is gathered into immense heaps, where it is subjected to the action of the air, which dries it and transforms it into a powder, which is disposed of for agricultural purposes. Another system consists in rapidly transforming chemically the sewage conveyed into special factories, where, by successive modifications, the active principle is extracted under the form of ammonium sulphate. A third system consists in conveying the fæcal and refuse matters, with or without surface-drainage waters, to the soil, where it serves for manure, or to some river, or to the sea.

The conduction of sewerage to some near water-course ought to be abandoned, for the presence of these matters pollutes and contaminates these waters, and is a source of contagion and the propagation of infectious diseases. Nor can much be said at the present day in favor of the system of privy-vaults and cesspools, which are an abomination. The movable-closet (*fosse-mobile*) system is an improvement on the above; here the excreta are removed in pails or barrels to some central depot, where they are chemically transformed or destroyed. To this system for the disposal of sewage may be joined the pneumatic system now in vogue

in some parts of Paris, whereby the fæcal matters are sucked (pumped) from the privies to a central depot, where they are converted into a fertilizing powder for the farmers in the country. This system, called the Berlier system, is operative in the Madeleine quarter, and at the Pepinière barracks over a net-work of ten kilometres in extent, and is a good one for many places, but it is hardly applicable to large cities in their entirety; moreover, it does not entirely do away with the privy-vault nuisance, and still leaves a certain amount of excreta in the vaults. A system very similar to the above is that of Waring, which has been in use in Paris since 1884; by this system the slops and refuse of the houses, mixed with the fæcal matters, are swept along by masses of water in glazed earthenware pipes, the ultimate destination of the sewage being the same as in the Berlier system.

There remains the question of the final disposal of sewage, and leaving one side the conveyance of slops, filth, and excrement into water-courses, which, as before said, is a system to be condemned, only two systems remain for discussion. In the one, the fæcal matters are conveyed to the soil by a provision of air-tight tanks and pipes; this is the Liernur pneumatic system, which has been tried at Brussels and Amsterdam. In the other, all refuse matters, house filth, etc., go into the main sewers, and are carried to the land and utilized for agricultural purposes.

The advocates of this system of sewage disposal have alleged the following arguments therefor: first, the method is an economical one, inasmuch as the filth of the towns constitutes a fertilizing material of exceeding value for the land; then, again, the sewerage waters are rapidly appropriated by the soil and undergo complete purification there, as has been demonstrated by chemical analysis and by bacteriology, on condition, however, that the ground be permeable, and that it be well worked over, with rich crops as the result. It must be provided, moreover, that the quantity of sewage thus disposed of shall not be too great for the area of ground submitted to its influence.

The opponents of this system have maintained that it is not yet proved that the soil absolutely deprives sewerage matters of their pathogenic microbes, and that the vegetables or cereals grown on such soil will not be contaminated by these microbes, and, in particular, by those of typhoid fever. They have also insisted on the ultimate saturation of soil that has for a series of years been the receptacle of so much filth (the land is said, in common parlance, to become *sick* of sewage), and they have appealed finally to statistics to show that the occupants of these sewage farms are more or less subject to infectious diseases.

The problem does not seem yet to be solved, and at the same time it must be admitted that the advocates of these systems of sewage disposal have the best of the argument, and for the following sufficient reason: a certain number of large cities have adopted the system, and have had experimental proof of the benefits thereof, and, as an instance, I may refer to Berlin, a city which makes so much account of public hygiene. I think that there would even be unanimity on this point if the quantity of sewage waters to be distributed to the lands could be limited to so much a hectare and so much a year,—say ten thousand cubic metres per hectare, which would never exhaust the capability of the soil for the filtration and purification of these matters. This estimate is even considerably smaller than conclusions drawn from trials made in the plains of Gennevilliers seem to warrant, and which raise the figure to forty thousand cubic metres per hectare.

Hence, then, in order that this system of sewage disposal may give all the results that hygiene demands of it, it must fulfil the following conditions: the sewers should be laid so that there shall be a sufficient fall to insure a rapid flow of the waste waters; their walls should be perfectly tight, so that there can be no leakage; the quantity of excreta which flows through them should be estimated at about ten litres per day for each inhabitant; lastly, the soil that is to be the final recipient of this refuse must be porous and under thorough cultivation, and the quantity of sewage disposed of should not exceed forty thousand cubic metres per hectare (2.5 acres).

This lecture is already long, nor have I been able to do more than glance at this great question of sewerage. Those who would study it more at length would do well to consult the report of Bourneville, and the interesting work which Rochard has published on Social Hygiene. But it is not enough to have prevented by different means of disinfection the spread of the disease, it is equally necessary that the contaminated individual shall be isolated, and it is this next aspect of the question of prophylactic hygiene that I propose to consider in the following lecture.

ON THE SEPARATION OF MOTOR AND TROPHIC NERVES OF MUSCLE.

ALSO A CONTRIBUTION TO OUR KNOWLEDGE OF THE HEAT-REGULATING MECHANISM OF WARM-BLOODED ANIMALS.

By Geo. T. Kemp, Ph.D. (Johns Hopkins).*

Part I.

In working with animals under the influence of curare, I have often been struck by the great and rapid fall of their temperature, especially if the work was done in a cold room. From a consideration of this, with the well-known experiments of Röhrig and Zuntz, showing that the total metabolism of the body may be diminished as much as fifty per cent. by curare, and the exceedingly interesting observations more recently published from Pflüger's laboratory,—viz., that a curarized mammal behaves very much like a cold-blooded animal,—I was led to make a more thorough study of the influence of curare on animal heat, instituting experiments which, so far as I am able to learn, have not been made before. As early as 1811 Brodie† advocated the theory that the production of heat in warm-blooded animals was under the control of the nervous system, and later, in 1837,‡ he reported a case of injury to the spinal cord, which was followed by a rise of temperature to 111°. This, it may be said, gave the start to inquiry in this field, and the results of subsequent investigations have more than sufficed to show that there is a most intimate relation between the nervous system and the production and regulation of heat in warm-blooded animals, although the exact nature of this relationship is far from being understood.

Clinical evidence of temperature disturbances following injuries to the spinal cord has been too conflicting to draw any satisfactory conclusion therefrom, and, indeed, in the results of experimental investigations a greater uniformity could be desired.

The early work of Bernard, Schiff, Chossat, Brodie, Bezold, and Tscheschichin gave as a general result that complete section of the spinal cord was followed by a more or less rapid fall of temperature.

Exceptions, however, have been noted. Naunyn and Quincke,§ in reviewing this work, come to the conclusion that the fall of temperature is due to a too rapid loss of heat from the body, and find in their own experiments that if loss of heat be prevented by surrounding the animal with wadding, or placing it in a warm box at a temperature of about 26° to 30° C. (79° to 86° F.), the temperature first falls, and then steadily rises‖ until it passes the temperature of the normal animal. These results were also obtained by Binz¶ in 1870. In observing the enormous rise which Binz finds after section of the cord, it must be borne in mind that he used morphine and chloroform to anæsthetize his dogs for the operation, and when the dog was put into the box its temperature was several degrees below the normal, owing to the influence of these drugs.

These results of Naunyn and Quincke, and of Binz have not stood unchallenged. In 1872 Rosenthal,** agreeing with Riegel, found that, unless the surroundings of the animal were kept at 32° C. (89.6° F.), the temperature fell continuously, and even when a rise was produced by keeping the animal in a box at 32°, the temperature could not be made to pass to any extent above the normal.

The position of Rosenthal and Riegel is supported by Parinaud,†† who found that after section of the spinal cord in rabbits there was a progressive fall in temperature until death. Some of Parinaud's experiments lasted for several days, and were performed at the Hôtel Dieu in Paris during the summer months, when the temperature of the laboratory was about equal to that of the hot box used in Naunyn and Quincke's experiments. He thus avoided the source of error derived from the saturation of air with moisture, which resulted from the arrangement employed by Naunyn and Quincke for heating the chamber in which to put the animals. Parinaud's animals were placed in surroundings as favorable as possible for results of the greatest reliability. The importance of this difference must not be underestimated, for Naunyn and Quincke used dogs in their experiments, and these animals rely on quickened respiration and consequent increased evaporation from the lungs as the chief means at their command for getting rid of an

* Associate Director of the Departments of Physiology and Bacteriology, Hoagland Laboratory, Brooklyn, N. Y.

† *Phil. Trans.*, 1811 and 1812.

‡ *Med.-Chirurg. Trans.*, vol. xx. p. 119.

§ *Archiv für Anatomie und Physiologie*, 1866, p. 176.

‖ Op. cit., p. 180.

¶ *Virchow's Arch.*, vol. li. pp. 13–20.

** Rosenthal, "Zur Kenntniss der Wärmeregulirung bei der warmblütigen Thieren," Erlangen. Quoted from *Hoffman and Schwalbe's Jahresbericht*, vol. i., 1872, p. 575.

†† *Archives de Physiol.*, 2ième série, vol. iv., 1877, pp. 63–82 and 310–333.

excess of heat from their bodies. Another feature of Parinaud's work is that the temperature was taken at different parts of the body simultaneously, and the rectal temperature was not relied upon entirely as an index of heat throughout the body.

This is quite an important point, and is needed to supplement other observations in this field in which similar precautions were not taken; for it is perfectly conceivable that the distribution of blood in the body may be such as to give a lowered temperature in the rectum without the other parts of the body being so affected.

It is evident from the foregoing that the bodily temperature is profoundly affected by cutting the spinal cord, and it now concerns us to decide in what way such injury produces its effects.

The maintenance of a constant temperature by warm-blooded animals is clearly dependent upon two things,—viz., the amount of heat produced in the system and the amount of heat given off by the body, either directly as heat, or in some other form of energy.

In animals, such as dogs and rabbits, in which there is very little sweating, an excess of heat must be controlled almost entirely by increased respiration, or by an increase in the loss of heat from the surface of the animal's body to the surrounding air.

Cutting the cord does not increase the respirations, so that this factor may be disposed of; but it does very materially increase the dissipation of heat from the body. It is a well-known fact that cutting the cord causes an immediate fall in the general blood-pressure of an animal, and much discussion has arisen, on both theoretical and experimental grounds, as to whether this had increased dissipation of heat for its consequence. A reopening of this discussion is now not necessary, for Wood,* in his elaborate research on fever, has abundantly shown by direct calorimetric observations that section of the cord above the splanchnics is followed by a very great increase in the amount of heat dissipated in a given time. Thus the fall in temperature which follows dividing the cord could be explained by the excessive loss of heat from the animal's body, but we have evidence that its action is more far-reaching than this.

In the first place, the influence of a fall of blood-pressure on the oxidation in the tissues, and a consequent alteration in heat-production, is by no means impossible, and physiologists of such note as Haidenhain,† after considering all the evidence up to their time of writing, have denied the existence of a thermotaxic mechanism in the body, and have placed the regulation of animal heat entirely in the hands of the vaso-motor system. Since the time that Haidenhain so warmly defended this theory, there has been a steady increase of evidence pointing to the direct control of animal heat by the nervous system, so that we are hardly permitted to entertain doubts on the subject at present. In fact, we have strong evidence that cutting the cord causes a fall of bodily temperature, not only by increasing the amount of heat dissipated, but also by diminishing the amount of heat produced, and this, indeed, by direct action (or, more probably, cessation of action) of the nervous system on the metabolism in the individual cells.

Thus Pflüger‡ has shown that cutting the cord at the sixth or seventh cervical vertebra may reduce the metabolism of the body about one-half, as measured by the amount of O consumed and CO_2 excreted. And these results are directly confirmed by Wood's§ calorimetric observations, which show that section of the cord is followed by a diminution of heat produced, amounting to from ten per cent. to eighty per cent.

The study of the effect of *curare* on metabolism has also yielded much valuable information on this subject.

Röhrig and Zuntz‖ found that in curarized animals the consumption of O and the elimination of CO_2 were enormously diminished. Their results were confirmed by Jolyet and Regnard,¶ who, using Regnault and Reiset's apparatus, found curare that diminished metabolism more than section of the medulla; and also in the following year by Pflüger, in his celebrated paper "Ueber Wärme und Oxydation der lebendigen Materie,"** in which he

* "Fever: A Study in Morbid and Normal Physiology."—*Smithsonian Contributions to Knowledge*, No. 357.

† *Arch. f. d. Gesammt. Physiol.*, vol. iii., 1870, and vol. v., 1872.

‡ *Arch. f. d. Gesammt. Physiol.*, vol. xii., 1876, p. 284

§ Op. cit., p. 45.

‖ *Arch. f. d. Gesammt. Physiol.*, vol. iv., 1871, pp. 84–86; vol. xii., 1876, pp. 522–528.

¶ *Gaz. Méd. de Paris*, 1877, pp. 179 and 190. Quoted from *Hoffman and Schwalbe's Jahresbericht*, vol. vii. p. 328.

** *Arch. f. d. Gesammt. Physiol.*, 1878, vol. xviii. p. 302.

gives as the results of many experiments, that the excretion of CO_2 is diminished about 37.4 per cent., while the consumption of O is diminished 35.2 per cent., thus adding the interesting observation that the respiratory coefficient is practically unaffected.

Certain drugs, such as ether, chloroform, phosphorus (in large doses), etc., have been shown to lower metabolism, and this probably by direct action upon the protoplasm of the cells. To show that curare acts on the nerves and not on the cellular protoplasm, Colosanti* made the following experiments. Dogs were killed by bleeding, and then artificial circulation was kept up through each thigh. The blood passing through one thigh was pure, while curare was added to the blood which supplied the other. Both specimens of blood were then examined, and it was found that a considerable amount of oxygen was used up in each specimen. Just as much, however, was taken from the curarized blood as from the pure blood, which showed that curare did not affect the oxidizing power of the tissues themselves. This is not absolutely a crucial test, as Colosanti himself points out, for bleeding the animal to death would certainly affect the vitality of the tissues, but it serves at least to render the truth of his deductions in the highest degree probable, and is weighty evidence to show that all the striking effects produced in metabolism by curare are wrought exclusively by its action on the nervous system.

We have thus seen that direct lesions of the nervous system, and also drugs (curare) which are known to have a paralyzing action on certain nerves will cause a lessened chemical activity of the protoplasm in the cells of the body, and we have with great probability excluded the possibility of this action of curare being other than through the nerves; thus we have all we can desire in the form of negative evidence to show that oxidation in the tissues, and consequently the production of heat, is directly controlled by the nervous system. But a certain amount of positive evidence is also forthcoming.

Liebermeister† contended that an increased production of heat in the body could be reflexly produced by subjecting the body to sudden cold. He based this theory upon the scarcely sufficient foundation of the fact that a rise of temperature in the axilla follows a sudden withdrawal of heat from the body. He defended his theory for several years, and finally‡ brought stronger experimental proof to his aid in the experiments of Gildemeister,§ made under his direction.

Gildemeister found that there was an increase of CO_2 given off from a man while in a cold bath, more of the CO_2 being excreted the colder the bath. (The lowest temperature used was 18° C. (64.5° F.).) A reflex excitation of metabolism had previously been obtained by Sanders-Ezn.‖ Röhrig and Zuntz¶ likewise obtained a reflex increase of metabolism, as did Pflüger also, who made the additional important observation that a point was reached for low temperatures, below which the system was unable to react; and then the metabolism of a mammal was similar to that of a cold-blooded animal. He also found that when an animal was curarized and placed in a hot or a cold bath, its body readily took the temperature of the bath, and then raising the temperature of the bath increased metabolism, while lowering the temperature diminished metabolism accordingly, thus showing that a mammal thoroughly under curare has its heat-regulating mechanism practically destroyed, and behaves precisely as a frog or other low animal in which no heat regulators exist.

Zuntz** has recently added another observation of intense interest to those already given. He finds that in curarized rabbits kept at a constant temperature in a bath, the amount of O consumed and CO_2 excreted (Gaswechsel) remained constant for a whole day, and, so long as the rabbit was in this state, *it was impossible to induce fever* by septic injections which produced a raging fever in uncurarized rabbits in a few hours.

It has been the tendency of authorities for some time to refer fever to nervous action entirely, and here we have strong evidence in favor of this assumption, towards which many facts have been pointing, but for which experimental proof has been lacking. We find, therefore, abundant evidence to show that there is a nervous mechanism in the body of warm-blooded animals which controls the production of heat. When the body is ex-

* *Arch. f. d. Gesammt. Physiol.*, vol. xvi., 1878, pp. 157-172.

† *Arch. f. Anat. u. Physiol.*, 1860, pp. 520 and 589. Quoted from Rosenthal in *Hermann's Handbuch*, ed. 1880, vol. iv. p. 413.

‡ *Virchow's Archiv.*, vol. ., 1871, p. 130.

§ Gildemeister, "Ueber die Kohlensäureproduction bei der Anwendung von kalten Bädern und anderen Wärmeentziehungen." Basel, 1870.

‖ *Ludwig's Arbeiten*, 1867.

¶ Op. cit., p. 90.

** *Centralbl. f. d. Med. Wiss.*, 1882, p. 562.

posed to colder surroundings, and more heat is given off, the afferent nerves from the skin arouse the proper centres, and we have an increased chemical activity of the cells, reflexly brought about, so that more heat is produced and the temperature of the body does not fall. In maintaining the temperature of warm-blooded animals, the vaso-motor system also plays a conspicuous part, for when the body is exposed to cold there is a constriction of the vessels in the skin, and consequently less heat is given off. When this is very marked, the erector pili muscles take part, and give rise to the appearance of "goose-flesh."

Besides the heat-*producing* and the vaso-motor functions, the nervous system probably exerts other influences on heat-regulation, whose importance must not be overlooked,—viz., the heat inhibitory. Several observations are on record to show the probability of centres above the line of juncture of the medulla and pons, which exercise a marked control on the production of heat in the body. The exact nature and location of these centres has been the subject of much dispute. Injuries to the brain are frequently followed by a rise of bodily temperature (107° to 108° F.), without any very apparent vaso-motor disturbance. This is especially the case where the surface region of the pons is the seat of the lesion.

Tscheschichin, Wood, Eulenberg and Landois, and Ott all find that section of the medulla from the pons is followed by a rise of temperature. This is denied by other observers, but the positive results of the above authors are too striking to be without significance. Bechterew and Hitzig and others find that destruction of the cortex in the region of the sulcus-cruciatus of the dog is followed by thermic disturbances in the parts for which this region is recognized as the motor area.

Eulenberg and Landois,* whose communication is the most recent, regard the disturbances as due to the lesion of a cortical vaso-motor centre, but Wood,† after a thorough review of the subject, while admitting the possibility of the centre being vaso-motor in function, is more inclined to the view that the centre is a true heat inhibitory one, thus agreeing with Tscheschichin, whose results were the earliest published. Bernard's theory of calorific and frigorific nerves is now generally regarded as founded upon vaso-motor phenomena, mistaken by Bernard for the effects of a genuine thermo-regulating action of the nerves. Having now studied the arrangement by which the nervous system controls the production and dissipation of animal heat, or, in other words, how it is that warm blooded animals maintain a constant temperature, it next becomes of interest to study the nature and seat of this chemical activity which the nervous system so directly controls. We know that every living cell in the body lives by a process of oxidation, or burning up of its contents, and the acquisition of a fresh supply of fuel from the blood, which, in turn, is to be burnt again. The life, therefore, of every cell in the body contributes towards the heat of the whole system.

We also know that the special activity of any gland, such as the salivary glands when secreting, or the glands of the stomach during digestion, is accompanied by an increased amount of heat given out to the blood, and this circulates through the body. Every beat of the heart does likewise, but all this is true of cold-blooded animals as well as of mammals. What, then, does the nervous system call on for increased activity when more heat is needed in the body? Physiological investigation has answered, "The muscles."

We all know how much heat the muscles give off when in a state of activity and motion, but there is a quiet activity in the muscles, which is unaccompanied by any visible motion, and which only involves the motion of atoms and molecules in the muscle-substance itself; this it is that stands the servant of the nervous system, and furnishes more or less heat, as the nerves command, even when, as during sleep, every trace of motion is absent. At present two kinds of nerves are recognized as supplying muscle,—the sensory and the motor; with a possibility of a third variety,—the trophic. The question now arises, By which of these channels do the nervous impulses which control the production of heat reach the muscle? The sensory nerves we know to be excluded, and we have, then, only to decide whether there really exist trophic nerves which govern the metabolism, or whether this function is performed by the motor nerves. Analogy, with certain other tissues, would lead us to believe in true trophic nerves for muscle, and both experimental physiology and pathology furnish good evidence for the existence of trophic nerves to muscle independent of the question of heat;

* *Centralbl. f. d. Med. Wiss.*, 1876, p. 262.

† Op. cit., p. 254.

but, on the other hand, the only nerves which curare has hitherto been known to paralyze are motor nerves. Now, the remarkable influence of curare on the heat-regulating mechanism has already been pointed out, and it has led some physiologists to believe that the influences controlling metabolism reach the muscle through the motor nerves. This is the opinion held by Röhrig and Zuntz,* and also by Riegel,† while Zuntz, in later papers, says the extent to which this function of motor nerves is exercised is more than is recognized, and that all the breaking down of muscle from excessive metabolism of fever is produced through the motor nerves.‡

It was with the object of deciding, if possible, whether the metabolism of muscle was controlled by the motor nerves, or whether a set of true trophic fibres existed, that my experiments with curare were undertaken, and the results of these experiments will be given in the next number.

Before leaving the subject of the heat metabolism of muscle, I wish to call attention to a publication on the subject, which I have not often seen quoted, but which is of great interest in this connection. The experiment is one of Abeles,§ who amputated the thigh of a dog, and then gave curare. At intervals, varying in the different experiments from twenty-five minutes to one and three-quarters hours, he cut off the other thigh. He then estimated the percentage of glycogen in the muscles of the thigh amputated before giving curare, and then the percentage of glycogen in the thigh amputated after the curare had been in the circulation. He found that the muscles of the curarized leg always gave more glycogen than the sound one. The following is a table of three experiments:

Muscles without curare.	Muscles with curare.
2.27	2.46
1.37	1.59
.75	.82

The difference in the percentage is very small and almost within the limits of error of observation, but the short time that the curare was allowed to circulate, and the small percentage of glycogen in muscle at best, would preclude larger figures. These results are very interesting, especially when taken into consideration with the fact that diabetes almost invariably results from curare-poisoning, and they are given for what they are worth in connection with the subject of this paper.

(To be continued.)

* *Arch. f. d. Gesammt. Physiol.*, 1871, vol. iv. p. 90.

† Same *Archiv.*, vol. iv. p. 401.

‡ "Wir wurden so zu dem wichtigen Schlusse geführt, dass ein viel grössere Bruchtheil des thierischen Stoffwechsels als man bisher angenommen hatte, durch Erregung der motorischen Nerven bedingt sei, welche Erregung auch im scheinbar ruhenden Muskel im schwachem Masse andauern und die Grösse von dessen Stoffwechsel bedingen. Im Bewusstsein der Gefahr des Irrens welche die angeführte Momente bedingen, glaube ich doch jetzt über eine genügende Zahl von Versuchen zu verfügen, um den Satz aufstellen zu Können, dass *nur die Innervation der Muskeln der fieberhaften steigerung des thierisches Oxydationsprocesses sei*" (*Arch. f. d. Gesammt. Physiol.*, 1876, vol. xii. p. 522).

§ *Med. Jahrbücher*, 1877, pp. 551–558. Quoted from *Jahresbericht üb. d. Fortsch. d. Thierchemie*, vol. vii. p. 63.

ISO-NITROSO-ANTIPYRIN.

By H. C. Wood, M.D., and John Marshall, M.D., Philadelphia, Pa.

BEFORE the *Western Druggist* of December, 1888, containing the paper of Professor E. B. Stuart upon "The Incompatibility of Spirit of Nitrous Ether and Antipyrin," had been received, our attention had been called to the remarkable change of color which occurs when ordinary sweet spirits of nitre has antipyrin added to it. An abstract of the paper of Professor Stuart has already been published in the Therapeutic Gazette, and we shall, therefore, simply state the results of our own studies, without allusion to what has been done. All the assertions which are made in this article, whether novel or old, have had their accuracy verified by actual experiment.

The discoverer of antipyrin, Knorr,‖ found that nitrous acid produces with antipyrin a new compound, to which he gave the name iso-nitroso-antipyrin, and which crystallizes in small bluish-green crystals, is sparingly soluble in water, and has the formula $C_{11}H_{11}N_3O_2$.

The iso-nitroso-antipyrin is not produced unless the liquid to which the antipyrin is added contains free nitrous acid. Thus, potassium nitrite with antipyrin undergoes no decomposition, and the green compound is not generated, but, on the addition of a stronger acid to such a solution, nitrous acid is immediately set free and the green compound is formed.

Chemically pure anhydrous ethyl nitrite, the principal therapeutic constituent of sweet

‖ *Berichte d. Deutsch. Chem. Ges.*, Bd. xvii. p. 2038, 1884.

spirits of nitre, dissolves antipyrin, but no greenish coloration, indicating the formation of the green compound, is imparted to the solution until the lapse of twenty or thirty minutes.

The production of the greenish coloration under these conditions is due to nitrous acid being set free from the ethyl nitrite by the slow absorption of water from the atmosphere. This decomposition of the ethyl nitrite, with the separation of crystals of iso-nitroso-antipyrin, occurs immediately on the addition of water, as is demonstrated by treating ethyl nitrite containing antipyrin in solution with a few drops of water.

The sweet spirits of nitre of the Pharmacopœia, which is a liquid containing about five per cent. of ethyl nitrite, almost invariably contains free nitrous acid, varying in quantity from a trace to a visible quantity,—*i.e.*, as shown by the slight brownish-red coloration of the liquid which is sometimes observed.

Of six separate specimens of sweet spirits of nitre obtained at the apothecaries', five changed to a greenish color on the addition of antipyrin; the sixth did not respond; but, on examination, no ethyl nitrite was found, and therefore it could hardly be expected to contain free nitrous acid.

The fact that chemically pure nitrite of ethyl does not react with antipyrin is another argument in favor of the adoption by the Pharmacopœia of a standard solution of pure nitrite of ethyl, instead of the present uncertain preparation. Of course such solution should be alcoholic, or at least not watery. (See leader present number of THERAPEUTIC GAZETTE.)

The iso-nitroso-antipyrin employed in the experiments here described was prepared by adding the calculated quantity of potassium nitrite to an acidulated aqueous solution of antipyrin. The liquid became at once bluish green in color, and in a few minutes there was an abundant production of crystals. These were collected on a filter, thoroughly washed with cold water, and allowed to dry on bibulous paper at ordinary temperature.

In preparing the iso-nitroso-antipyrin it was noticed that the filtrate from the crystals changed in color from green to brown, and developed a very distinct hydrocyanic acid odor after standing a few hours. The presence of cyanogen was confirmed by the formation of crystals of argentic cyanide in a drop of argentic nitrate solution placed on a watch-glass and inverted over the beaker containing the filtrate.

Dilute sulphuric acid, hydrochloric acid, and acetic acid act upon solutions of iso-nitroso-antipyrin, causing the evolution of cyanogen, and, indeed, a mixture of equal volumes of a saturated aqueous solution of antipyrin and c. p. ethyl nitrite, without the addition of an acid, undergoes decomposition on standing several hours with the evolution of cyanogen. The quantity of cyanogen produced in this decomposition is not large, and therefore could hardly be a cause of serious trouble.

That this decomposition may occur in the stomach was demonstrated by adding iso-nitroso-antipyrin to a .2 per cent. solution of hydrochloric acid, and keeping the whole at the temperature of the body in a water oven. The quantity of cyanogen evolved is, however, so slight that no danger need be feared. The amount given off in an hour from .5 gramme of iso-nitroso-antipyrin, mixed with fifty cubic centimetres of the .2 per cent. acid solution, is only sufficient to give a few crystals of argentic cyanide with argentic nitrate on an inverted watch-glass, equivalent possibly to less than one-hundred thousandth part of a grain of hydrocyanic acid.

In determining whether the iso-nitroso-antipyrin possessed toxic properties, it was administered under various conditions to dogs and rabbits, but in no case, as the following experiments show, were the slightest untoward effects observed.

Experiment 1.—Very young rabbit; weight, ¾ of a pound. ½ ounce of saturated solution (.375 per cent.) was injected hypodermically; no effect was produced.

Experiment 2.—Young rabbit; weight, 1 pound. ½ gramme was given by the mouth; no perceptible effect, and no reduction of the rectal temperature.

Experiment 3.—Dog; weight, about 17 pounds. A paste was made with water of 1 gramme of iso-nitroso-antipyrin, and given to the dog on a piece of meat. No deleterious result, or, indeed, any change in the behavior of the dog, could be noticed.

Experiment 4.—Dog; weight, about 24 pounds. 1 gramme of the compound made into a paste was given to the dog on a piece of meat; no observable effect. After the lapse of an hour another gramme of the compound was given to the same dog. The dog was under direct observation for four hours after this last portion was given, and not the slightest change in his well-being could be noticed.

Whether ill effects are produced when a

solution of antipyrin and sweet spirits of nitre is administered was determined by giving 1 gramme of antipyrin in aqueous solution to the dog mentioned in Experiment 2, and followed in fifteen minutes by the administration of .5 cubic centimetre of c. p. ethyl nitrite contained in the appropriate quantity of alcohol and water to effect its solution; no ill effects resulted.

Three hours after the above administration of antipyrin and ethyl nitrite, separately, a solution containing 1 gramme of antipyrin and .5 cubic centimetre of ethyl nitrite, with alcohol and water, was given to the same dog; no ill effects resulted.

It should be remembered that on administering antipyrin with sweet spirits of nitre, the iso-nitroso-antipyrin may be produced, and that just as much antipyrin is rendered inert or destroyed as was required in the formation of the new compound, and thus the anticipated therapeutic effect of the quantity of antipyrin originally given is not obtained.

A NEW TREATMENT FOR TUBERCULOSIS.

By John A. Lanigan, M.D., Hyde Park, Mass.

FOR many years I have held a belief which, if it is not entirely new, is, at least, so little spoken of in medical literature (if at all) as to be either considered as an undisputed fact or an unexplored region of thought. I refer to an antagonism between certain cachexias. I have never read anything illustrative of this fact, or anything distinctly setting it forth *as a fact.* I have noticed in the writings of some eminent authors an allusion to the *infrequency* of a certain disease occurring in individuals of a certain other cachexia, but this amounts to little more than a *hint* in the right direction.

However, entertaining this belief, and being led by circumstances as well as choice to the special study of diseases of the throat and lungs, I began to make inquiries to find out if, as there were inherited traits of character that were diametrically opposed to others, there might also be certain *inherited cachexias* that in like manner were antagonistic of each other; and hence, that in the same individual, the one could only exist at the expense of the other.

Prosecuting my studies in this direction, during which time I visited many of the hospitals in this country and Canada, I could not help noting the fact that in no case whatever out of two hundred and fifty cases of phthisis could it be found that *phthisis* and *rheumatism* had ever attacked the same individual consecutively or simultaneously; and, on the other hand, I observed that rheumatic persons had invariably good, healthy lungs. This certainly was presumptive evidence sufficient to warrant me in the suspicion that there *might* be some antagonism between these two diseases.

Could it be that the morbific poison of rheumatism was destructive to the existence of the bacilli of tuberculosis? Such, at least, appeared to be the most natural conclusion.

The bacilli of tuberculosis attack and feed upon the nervous texture of our bodies, for it is this texture *alone* that contains any living matter (bioplasm), and living matter feeds on living matter in proportion to the amount of that in their systems. Now, believing thus, I thought, if it were possible to introduce into the human system a material that would be destructive to the bacilli without in any way jeopardizing the life of the individual, that the only true and scientific method would be found for the *cure* of consumption.

Following in this train of thought, I tried the *hypodermic* injections of a solution of sulphuretted hydrogen, which I believed would destroy the lower order of animal life, but I was somewhat disappointed in this, although I met with an apparent success in several cases by the disappearance of the fever, or, more properly, a reduction of the temperature. This was some time previous to the appearance of the Bergeon method of treatment. Failing in procuring an *antidote* by artificial means, I concluded to try what appeared to me nature's remedy or antidote, and so I resolved on the introduction into the consumptive of the blood of a rheumatic.

The best way to do this I considered was by transfusion, as the hypodermic method appeared out of the question, so, after some difficulty, I succeeded in getting a patient, who had been to a great many excellent physicians, to consent to my method, which was of course the transfusion of blood from a rheumatic patient (one suffering from acute rheumatism) into the vein of a consumptive. I applied this treatment after the usual method (the consumptive being in the same room with the rheumatic) in two cases. The first case, I injected four ounces, each time twice; the second, six ounces only once. In both these cases rheumatism was established in a week. The third case I transfused eight ounces, and there was an increase of temperature to 104°, and after that the temperature fell to 99° (in a

day), but no signs of any pain in the joints or elsewhere. Nevertheless, all three patients did well, their weight increased, temperature was lowered, pulse and other symptoms became normal, and there is every indication that they will do well, for strength, appetite, and everything tending to recuperation are in good condition. The only objection to the method appears to me to be the difficulty to get rheumatics to consent to part with their blood, although really in most cases I believe it is to their benefit.

My method of transfusion is the same as that which is known to every physician, and, as every one knows, there must be a great deal of care taken not to admit any air into the vein. I generally transfuse from the largest vein immediately above the joint affected with rheumatism into the arm of the consumptive.

The operation is simple enough, but two things are necessary,—first, be sure of your consumptive; and next, of your rheumatic. The after-treatment is to build up the nerves. If the patient has lungs enough to stand the operation he will get better immediately. I am willing to answer any questions that may be asked me from any readers or persons desiring information.

119 Fairmount Avenue.

A CASE OF MORPHINE-POISONING.

By T. H. Williams, M.D., Germantown, Tenn.

ON the 4th of December, 1888, Mrs. T., æt. 47 years, the wife of a well-to-do mechanic, took twenty-five grains of morphine sulphate in an attempt at suicide. She ingested the amount at 1 P.M. The husband, on his return from work, at 6 P.M., found her complaining and unwell. Sent immediately for me, and I arrived there at seven o'clock. She sent the father and son from the room, and told me she had taken three capsules of morphine, packed as hard as she could fill them.* I despatched the husband in haste for apomorphine and atropine, as I had none with me. He was detained one hour in quest of the order.

At 8 P.M. $\frac{1}{10}$ gr. atropine sulph., given hypodermically.

At 8.30 P.M. $\frac{1}{10}$ gr. atropine sulph. repeated.

At 9 P.M. $\frac{1}{10}$ gr. strychnine sulph., given hypodermically, also amyl nitrite used *pro re nata*.

At 10 30 P.M. the induced current was employed.

At 11 P.M. $\frac{1}{10}$ gr. atropine sulph. repeated.

At 12 P.M. $\frac{1}{10}$ gr. strychnine sulph. repeated; nitrite amyl discontinued.

At 4 A.M. $\frac{1}{10}$ gr. atropine repeated.

At 8 A.M. the antagonism was completed. The patient awoke from her opium sleep rational, but without the memory of what had transpired.

The last insertion of atropine, aided by the synergesic action of the strychnine, passed a little beyond the line of antagonism, as was evidenced by slight spasm of muscles of arm and face, and by the rich scarlet hue of the surface and the tortuous tracts of the arteries of the conjunctiva. In this case, these agents sought out an unpromising ground for competition, as it were; the patient was laboring under the effects of cerebral anæmia, conjoined with spinal irritation. When I saw her at seven o'clock this lethal agent ingested showed no disposition to hasten its work. Six hours had elapsed, not a sign of narcotism was present, and it was only after halting, doubting, and consideration that the above plan of action was formulated. Her condition was so at variance with her statement. Her mind was as clear as usual, and she took part in such topics as the occasion brought. Aside from a momentary doze, a trembling gait, and a pin-hole pupil, grave doubt as to the patient's veracity would have risen in any mind, especially when the lapse of time was taken into account since the ingestion of the drug. At half-past eight, when the second insertion of atropine was given, there was no trace of the former dose visible in the eye or upon the circulation. At nine o'clock a change came over the scene. Not a doubt could be entertained now of the truth of her statement. The effects of the atropine manifested itself in the pupil but for a short while. Somnolence now ensued, followed up, in an incredibly short time, by coma. The pulse became too rapid and intermitting to count, and losing often as much as two rhythmical systoles of the heart's action. At half-past nine the respiratory centre failed, after it had undergone a rapid decline for one-half an hour, and the heart took part in the menaced dissolution. Artificial respiration was practised, and amyl nitrite used to prevent sudden heart failure. The strychnine could not save the respiratory centre; it

* Three capsules were taken from the box she had and filled as she directed and weighed.

was rapidly overwhelmed. At half-past ten o'clock the induced current was magical in its effects, and was used throughout the restorative efforts. The poles were disposed after the following manner: The anode at the lowest conjoined root of the phrenic nerve; the cathode three inches below the ensiform cartilage and a little to the left of the median line, as at this point a respiratory impulse could be easily excited. At eleven o'clock, when the atropine was renewed, its effects were unmistakable, the pulse fell to 120,—the respiration rose to 10 impulses per minute, and could *maintain this number* for several minutes without faradic interference. At twelve o'clock the strychnine was also repeated, and, as all exigencies seemed met, the faradic current alone was used. At 4 A.M. the pupil seemed to be losing the effects of the atropine, and was drawing to a pin-hole condition, when $\frac{1}{10}$ gr. was repeated, and in one hour its effects were unmistakable: the work of antagonizing was drawing rapidly to a close. At eight o'clock the antagonism prevailed, reason returned, and, aside from weariness, the patient made no complaint and requested a little nourishment. The morphine was ingested at 1 P.M.; the toxic effect set in at nine o'clock, and this occurred after the second dose of atropine; eight hours elapsed before this agent began its work of death. A faulty assimilation must have been the bar to its entrance. That there exists an antagonism between these agents there cannot be a doubt; but under such conditions as herein related, where so much time had elapsed and every avenue barred and blocked, the race must of necessity be unequal. Yet it will in all probability be held by many that if the $\frac{1}{8}$ gr. of atropine employed in the antagonism had been given at the beginning the crisis of narcotism would have been *everted*, and the centre of respiration been so stimulated as to prevent its being overwhelmed by the opium salt. As to the disposition of this matter, grave doubts must be entertained on remembering the fact how rapidly the lethal effects were observable after two doses of the atropine were inserted. Possibly this might have been the design of nature's action to withhold or detain the drug, admitting only a small quantity at a time, making it possible for the systemic organs to receive and eliminate the poison as rapidly as assimilated. Yet I will insist that while atropine antagonizes opium and its derivative, there are conditions incident to the effects of this *narcotism* that atropine cannot meet. Nothing can be more plainly exhibited than this fact when the history of unsuccessful antagonisms are examined; there being such a preponderance of the one, it does not admit a possibility of an antagonistic effect. Had a strict reliance been placed upon a $\frac{1}{8}$ gr. of the atropine, the respiratory centre would have been so rapidly obtunded by the narcotism as to engender carbonic acid accumulation in the blood, and, by leading to the exclusion of this centre, to the extinction of every vital organ and every vital action. The extinction of the respiratory centre, the accumulation of carbonic acid, in this as well as many other cases, would have lead to such a condition as would have proved rapidly fatal. It was at this juncture that the *induced current* became a conspicuous addendum; it was this agent that caused a smothered-out function to be renewed; it was this that yielded the mastery of the situation, enabled the respiratory system to depurate the blood of its accumulating carbonic acid, and renew its vital powers at each respiration. There can be no doubt but the strychnine synergising with the atropine rendered its effect more lasting and quickened the antagonism. The rapidly failing circulation in this case was promptly reinstated by the timely use of amyl nitrite; its rapidity and certainty of action on the circulatory system suggested it as the fit agent for this work. When the crisis of the antagonism had been reached, with the aid of this agent and artificial respiration I was able to tide over till the faradic apparatus came. I am well convinced that without the aid of this device my efforts would have been *nil*. The exhaustion incident to the effects of a lethal agent is apparent to every observer, and, after a complete antagonism has been secured, the patient too often perishes from sheer exhaustion, a fact too painfully true. The practice so common in forcing laborious and fatiguing exercise should be deprecated as unrelenting barbarity, whereas the strength should not only be reserved but the body temperature kept up.

A CASE OF POISONING BY HYOSCINE.

By S. W. Morton, M.D., Philadelphia, Pa.

ABOUT one year ago I gave by mistake $\frac{1}{75}$ of a grain of hydrobromate of hyoscine subcutaneously to a patient, himself a physician, and a man of very large stature, weighing not less than two hundred pounds. His nervous system at the time was in a very

irritable and susceptible condition, and the drug was given to relieve sleeplessness, which had resisted all other known hypnotics. No other drug had been given within forty-eight hours.

The following are the symptoms in the order in which they occurred. Our patient was in bed when the injection was given him. Not more than five minutes had elapsed after the administration before he noticed a dryness of the mouth and throat, which was attended by a constant desire but, at the same time, an inability to swallow. This, combined with other strange general sensations, suggested to him that he had taken a new remedy. Whereupon he inquired what I had given him. In a few minutes more his speech became thick, and was accompanied by complete paralysis of the soft palate and the upper lip; the latter hung limp and immovable over the upper teeth, and gave the already much impaired voice a very muffled sound. The pupils at this time were noticed to be slightly dilated. He then arose from his bed and staggered half-way round the bedstead, guiding himself all the while by holding on to the side and foot-board. His movements could not have been more incoordinate had he been drunk from alcohol. During this excursion and for some time after his return to bed, say ten minutes, he indulged in a low muttering, out of which nothing intelligible could be made. His voice now gradually failed, becoming at last but a mere whisper. Clonic convulsions came on in the arms and legs, accompanied by a tetanic condition, which was manifested in opisthotonos; the pupils were widely dilated; the pulse a little slow and full; respiration slow and deep; skin slightly flushed. Here he made motions that he should be propped up, which was done. Soon his countenance became very lethargic, the convulsive movements gradually gave way to complete relaxation, his chin dropped upon his chest, and he was, within from twenty-five to thirty minutes from the time the drug was administered, in a profound stupor, in which the respiration remained slow and full, but was also stertorous; the pulse was slow, full, and compressible, and the pupil continued dilated. The stupor lasted six hours, when he awoke, arose as usual, and was himself again with the exception of some giddiness while dressing, a little difficulty in swallowing at breakfast, apparently due to some remaining paresis of the pharyngeal muscles, and a tendency to walk in a line curving to the left; all of which passed off by afternoon.

Although for the most part of the time deprived of his speech, he must have been conscious till the beginning of the profound stupor; for, on awaking, he related the sensation of dryness of the mouth and throat, the desire and inability to swallow, the getting out of bed, the paralysis of the upper lip, the clonic convulsions, and, most vividly, the sense of discomfort caused by the opisthotonos.

The preparation of hyoscine employed was manufactured in Germany, and obtained by me from Messrs. Bullock & Crenshaw, of this city, who say that it was most probably Merck's.

NOTES ON A CASE OF HYOSCINE-POISONING.

By Joseph S. Gibb, M.D., Philadelphia, Pa.

MR. S., æt. 58, an ataxic, by mistake took hypodermically hyoscine hydrobromate gr. $\frac{1}{60}$, in one dose. The injection was taken at twelve midnight. In a few moments (?) his wife noticed that he acted strangely.

I was summoned 12.45 A.M. (January 24), and found him wildly and actively delirious. His delirium was of a loquacious character, with many hallucinations. He would grasp at imaginary objects, talking incessantly, and was with difficulty kept in bed. At this time he seemed to recognize those about him, but in a short time all recognition failed, though he never failed to answer when loudly called.

His pulse was regular and full, beating 80 to 85 per minute, later 100. Respirations were not accelerated; on the contrary, they were diminished; at first about 18 per minute, they later fell to 14 and became irregular.

Pupils were neither dilated nor contracted, and thoroughly responsive to stimulus of light. There was an imperfect (?) efflorescence of skin. The tongue and throat were somewhat dry, though he was able to swallow. He was keenly sensible of pain and external irritation; would wince sensibly and audibly when cold applications were made to head, or at the prick of hypodermic-needle.

The most constant and, in fact, only alarming symptom from beginning to end, was the delirium. This continued to increase up to 5 A.M., when there was a slight amelioration, and he had a little rest, though no sleep. After this the delirium grew less and less, and consciousness slowly returned, and at

9 A.M. there was no delirium, and he talked rationally and coherently.

He was given ½-gr. doses of morphine every half-hour after 1.30 A.M. until 4 A.M., or until six doses, or three grs. were taken. The only perceptible effect of the medication was the rest he obtained about 5 A.M., lasting about one hour, and possibly a further depression of respiration. At ten o'clock the next morning the patient was delirious and excited. The articulation was very rapid, but rather indistinct, and there were violent twitchings in the muscles, mostly confined to the lower extremities; the pupils were contracted. At two o'clock in the afternoon there was still wandering delirium; vomiting occurred late in the day, and it was not until late in the evening that the patient had recovered his normal condition.

817 FRANKLIN STREET.

CYNARA SCOLYMUS, OR GARDEN ARTICHOKE.

BY W. W. LANE, M.D., WILMINGTON, N. C.

THIS plant has been long known to possess tonic and diuretic properties, but has never, to my knowledge, been brought into general use as a therapeutic agent.

It is perennial, and indigenous in Southern Europe, and cultivated in our gardens throughout the Southern States as a culinary vegetable. The receptacle and fleshy leaflets of the calyx are eaten after being boiled and dressed with butter, salt, and pepper.

When young the head may be cut up and eaten raw as a salad. Many years ago an English physician recommended a tincture and extract prepared from the leaves in rheumatic, gouty, and neuralgic affections. I have been in the habit of using the remedy with success for many years for general dropsy, and particularly ascites.

My father used the same also with almost unvaried success on his plantation among his negroes, generally in old people with broken-down constitutions.

I think there is no doubt of its diuretic and tonic virtues. My formula is a saturated tincture of the leaves in gin, with wineglassful three times daily. The plant is a rich, luxurious perennial, the stalk and leaves perishing with the first severe frost of winter, and putting up again from the root in the spring. It may be propagated from the seed or root. Either may be readily obtained from Charleston, where it is always a market vegetable.

Having seen no notice of this plant among the new remedies, I therefore desire to introduce it to the attention of the profession, with the sincere conviction that it will be a valuable addition to our therapeutic agents.

ANTIPYRIN IN THE FIRST STAGES OF LABOR.

We have already alluded to the fact that antipyrin is claimed during the first stages of labor to render the pains less severe, while at the same time not interfering with the progress of labor. Although these claims have not been universally admitted, and we have referred to papers in which the claim is made that it is entirely negative in its action in this respect, some results published by DR. J. O. VAN WINKLE in the *New York Medical Journal* for January 5, 1889, go far to substantiate them. He refers to several cases in which antipyrin was employed. The first dose was given when the os was about one-third dilated, except in cases where the pains were very severe from the outset, when it was ordered earlier. Antipyrin, gr. xv, and spt. ammonia, xxx drops, were administered every two hours during the first stage for three doses. The temperature and pulse were noted at the time the first dose was administered, and every hour thereafter until dilatation was complete. In almost every instance the patient said she felt greatly relieved, and this was evident from her behavior. In some cases the patient would fall asleep for an hour or so after the first or second dose. Incidentally it was noticed that the temperature fell from half a degree to a degree and a half Fahrenheit. The pulse became somewhat more frequent and the respiration slightly increased. Occasionally, if the pulse was rather rapid before administering the drug, it decreased in frequency. From statistics as to the duration of labor in cases where it was not employed, and where it was employed, it would seem that antipyrin does not increase the duration of labor, but, on the contrary, tends to lessen the first stage on an average of about half an hour, while the second stage remains practically the same, and in no case was there any injury done the mother or child. The author claims that antipyrin very materially lessens the severity of the pains during the first stage of labor, and has never given rise to any alarming symptoms, this immunity doubtless being due to the fact that in its administration it was always combined with a stimulant.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

TREATMENT OF POTT'S DISEASE AND VERTEBRAL FRACTURES.

AT his recent clinics in the University Hospital, Dr. H. C. Wood suggested and exemplified a novel method of carrying out an old indication in the treatment of injuries of the vertebral column, which seems to us to have so much of promise as to be worthy of extended trial by the profession. Many years ago, even before the well-known memoir of the late Professor J. K. Mitchell, of the Jefferson Medical College, with its numerous quaint illustrations, members of the profession recognized that the great indication in the treatment of Pott's disease is extension and removal of the superimposed weight from the diseased vertebra. Various devices for meeting this indication of extension have been from time to time suggested, and the value of the plaster jacket as a means of making permanent the temporary extension gained by hanging up a patient is universally recognized. The effectiveness of this jacket depends upon the fact that the general shape of the human body is that of two opposed cones, which are placed in such a position that the base of one is the shoulders and that of the other the pelvis.

Dr. Wood's suggestion consists in using the upper cone of the body as the basis for support. In other words, the plaster jacket is made with loops over the shoulder, and by means of the ordinary tripod, Mitchell's chair, a properly constructed wheel-crutch, or other device suited to the individual needs, the patient is suspended in the jacket. Dr. Wood showed in his clinic that an upward pull upon the jacket of eighty pounds did not disturb its position, even when the pulling had steadily been maintained for several hours, and that the pressure was uniformly spread over the surface, so that no pain or discomfort was caused.

In order to make the extension as complete as possible, it has been found advisable to add to the jacket an ordinary head-strap, so that when the patient is supported there is some pull upon the head as well as upon the jacket, care being exercised not to draw up the head sufficiently to cause discomfort.

In a case of a man suffering from syphilitic caries in the middle dorsal region, the results of the treatment have been very brilliant. At the first clinic the paraplegia was so nearly complete that the patient could not cross his legs when lying in bed for one week; at the second clinic, after treatment by the jacket, he was able to walk by simply aiding himself with some slight support of the hands. At the same time there was great relief of pain in the back and great increase of the bodily comfort. Dr. Wood, in his last clinic, further suggested the advisability of frequently changing the spinal jacket and putting it on each time after the man had been hung in the old jacket several hours, so as to get a progressively increased extension, and to hold such extension as obtained. In this way it was thought that in long-continued cases the spinal deformity might be reduced to a minimum.

A further use of the method was suggested in the treatment of fracture of the vertebral column. By a long-continued suspension of the body, there would be a chance of more or less rectification of the line of the vertebra, and by elevating the head of the bed in which the patient lies, and fastening the jacket to the head-board, a perpetual extension could be maintained, which would continuously drag upon the spinal muscles and the displaced

fractured ends of the bone, and by bringing back normal relations prevent degeneration of the spinal cord. When in any such case there is reason to believe that there has been a large injury of the spinal membranes, Dr. Wood advised an immediate operation and removal of clots, and then placing the patient in the extension apparatus. Dr. Wood further stated that in the nervous clinic at the University Hospital cases of the fractures of the vertebra are very frequent; but invariably they are of such old date that no relief can be provided. The method of suspension was tried in a man in which the injury had occurred about seven weeks before, but no yielding of the bones was apparent and no relief was obtained. It was also noted that the prolonged inclined position was well borne by the patient, excepting that the circulation of feet from lack of tone in the vessels became excessively bad, resulting in intense congestion and great swelling, and even much dropsical effusion.

Several methods of making the loops in the spinal jacket have been tried, but the one which was first suggested has proved most satisfactory. It is as follows:

After the first layer of the jacket is upon the patient, a piece of webbing, linen bandage, or other strong material, well wet, has one end applied to the lower edge of the jacket, in front and to one side. The webbing or bandage is then carried up over the shoulders, upon which it rests very loosely, and brought back of the jacket to the lower edge. A smaller bandage is then put upon the opposite side of the jacket; then the external layers of the jacket are put in place. In this way the strips which are used for the shoulder-loops are so incorporated with the jacket that they cannot be pulled out; at the same time there is no tendency for the jacket to be broken or crumpled up when the extension is applied.

If from tenderness of the projecting vertebra, or from the presence of a wound, surgical or otherwise, it is desired either to avoid pressure upon the vertebra, or to have access to the affected part, all that is necessary is to cut an opening in the jacket immediately over the diseased portion of the body, care being taken that this opening shall not be so large as to interfere with the strength of the jacket.

THE CHEMISTRY AND PHARMACOLOGY OF THE NITRITES.

WITH the exception of nitroglycerin, which, in its action, is probably to be included in the nitrite series, sweet spirits of nitre and the nitrite of amyl are the only members of this group which are officinal in the United States. The physiological action of the nitrites has been tolerably well determined as characterized by reduction in blood-pressure, dilatation of the arteries, acceleration of the pulse, and the formation of methæmoglobin; the action of the nitrites of potassium and sodium is likewise well established. Little is known as to the effect produced by the union of the nitrite group with the different organic radicals; and even in the case of sweet spirits of nitre it has been argued that its efficacy does not depend upon the ethyl nitrite which it contains, but on the aldehyde or some other constituent. Evidently the only way in which this matter could be settled would be through experiments conducted with a pure solution of ethyl nitrite. This research has formed part of an elaborate series of studies conducted in the research laboratory of the Pharmaceutical Society of Great Britain by a number of prominent investigators, who have published their results in the *Pharmaceutical Journal and Transactions* for December 22, 1888. Professor Dunstan and Mr. T. S. Dymond report a method of preparing the pure nitrite by the reaction of dilute sulphuric acid with sodium nitrite and alcohol at a low temperature, the resulting product being a perfectly pure ethyl nitrite, and sufficiently stable for general use.

The comparison between the action of the officinal spirits of nitrous ether and the pure nitrite of ethyl was undertaken by Professor Leech, who, however, has been unable to discover any difference between the activity of the freshly-prepared spirit and that of the solution of pure nitrite of ethyl: nor did they differ, as far as he has been able to ascertain, in their action on the kidneys.

Professor Leech has likewise tested the therapeutic value of this preparation in cases characterized by vascular contraction, and difficulty of breathing from bronchial spasm, and finds that both preparations have an equally marked value in preventing the attacks of angina pectoris, and in dilating the arterioles in relieving an overloaded heart. The spirit of nitrous ether is frequently poor

in nitrite, especially after the preparation has been kept for some time, and then it of course loses its value as a medicine. The solution of the nitrite of ethyl in alcohol and glycerin seems to be perfectly stable, the only possible drawback to its use being the large amount of alcohol which is required to administer such a dose as two minims of the nitrite. The adoption of a constant solution of the nitrite of ethyl, as a substitute for the inconstant sweet spirits of nitre, is evidently called for.

The action of the different constituents of the nitrite of amyl furnish the material of the other investigations. Professor Dunstan and Messrs. E. J. Woolley and W. Lloyd Williams have found that amyl nitrite nearly always contains iso-butyl nitrite and two other amyl nitrites, which they describe as α- and β-amyl nitrite, while one specimen contained also ethyl and propyl nitrites. Iso-butyl nitrite has been but little studied. It is a pale yellowish liquid, having a somewhat fragrant odor, and causing, when inhaled, flushing of the face and other disturbances. It is extremely unstable, and when administered to animals has been found by Professor Cash to cause rapid fall of blood-pressure, an acceleration of the pulse, and marked respiratory paralysis. The source of the α amyl and β-amyl nitrites, together with the other impurities often found in nitrite of amyl, is found in the fusel oil which is used in the manufacture of this preparation. Of all those constituents of nitrite of amyl, the α-amyl nitrite is the only one which has as yet been obtained pure, and it is at present under investigation by Professor Cash, who has not yet, however, published any definite conclusion as to its action: it seems, however, that there is considerable difference in the physiological action between the pure nitrites and the mixture of the two amyl nitrites. This alone would serve to account for the variability of the results which have been noted to follow the use in medicine of the officinal amyl nitrite.

In order to ascertain whether the substances other than nitrites which are contained in officinal amyl nitrite possess any therapeutic value, Dr. T. Lauder Brunton and Mr. T. Jessop Bokenham have compared the action of the pharmacopœal liquid with that of the two pure amyl nitrites, and have found that there is a marked difference in their action, they having found that preparations containing iso-butyl nitrite are much more active than the pure amyl nitrite. The unreliability, or, perhaps better, the failure sometimes of preparations of nitrite of amyl to relieve angina pectoris, may be attributed to the loss of the active constituents, as nitrites that are more than a few days old have failed to remove pain; and therefore many cases where amyl nitrite has failed in such a case to give relief are not to be attributed to the inefficacy of the remedy, but to the absence of the active agent. It seems that it is actually the iso-amyl nitrate to which the properties of the officinal nitrite are due.

These papers serve to show, in the first place, that the officinal nitrite of amyl and the officinal sweet spirits of nitre are remedies which are inconstant in their composition. They show that the active principle of sweet spirits of nitre is the ethyl nitrite which it contains, and the preparation which is at present the officinal one should be discarded and a definite solution of the ethyl nitrite should be substituted for it. The officinal amyl nitrite has been shown to contain varying constituents of the different members of the nitrite group, and these different constituents have different degrees of activity. While this investigation has not been carried as far as might be desired, it has, nevertheless, demonstrated that iso-amyl nitrite is more active, or rather more prompt in its action, than the rest of these bodies. When it has been shown which is best adapted to therapeutic use, and after a satisfactory and practical method has been devised for its preparation, it is then evident that such a preparation should replace the variable officinal nitrite of amyl.

SULPHONAL.

SULPHONAL appears to be rapidly entering the category of drugs which, enthusiastically recommended at first, gradually develop unfavorable actions or unreliability in the results produced. In our previous issue we alluded to several unfavorable complications, and to one case of marked toxic symptoms which followed its employment. In the *Wiener Medizinische Blätter* for December 13, 1888, Dr. Mathes, one of the most enthusiastic introducers of this drug, publishes his further experience concerning its use in the clinic of Professor Ziemssen in Munich. The cases in which this drug was employed were twenty-seven in number, with ninety-nine single doses, usually amounting

to from 15 to 30 grains. Of the twenty seven cases, hypnotic effects were produced in twenty-one cases of the most varied morbid processes, although in all severe diseases, such as pernicious anæmia, phthisis with distressing cough, typhoid fever, and delirium tremens, hypnotic results were never obtained. On the other hand, in cases of heart-disease, with or without disturbance of compensation in power, nervous insomnia, in spinal meningitis, in progressive paralysis, and trigeminal and intercostal neuralgia, the effects have been claimed to have been entirely satisfactory. Nevertheless, after-effects were noted in the majority of cases, consisting of a feeling of fatigue and depression, ringing in the ears, headache, and sometimes vertigo. These symptoms are usually stated to have disappeared in the course of the following day. It was noted that these disagreeable after-effects were more marked when the sleep produced by the sulphonal was accidentally interrupted. If the patients were allowed to sleep until they awoke spontaneously, and then allowed to lie undisturbed for some time, distressing after-effects usually did not appear. Further observations show that no special relation exists between the amount of dose and the severity of the after-effects. Thus, in one case 75 grains were administered without producing any effect, while in another instance one-tenth of this dose produced most severe symptoms. No accustoming to the drug was noted; in fact, it is even stated that after continued use of sulphonal half the usual dose will serve to produce the desired effect. The author concludes that while sulphonal is a useful hypnotic, it is by no means a thoroughly reliable one, but he still prefers it to other hypnotics on account of its freedom from odor and taste, and the absence of toxic action on the vital organs. The dose must be tested on each individual, though in the majority of cases 15 grains will be sufficient. He advises that it shall be given at least an hour before sleep is desired.

Professor Ott (*Prag. Med. Wochenschrift*, No. 40, 1888) has had in general a somewhat more favorable experience with sulphonal, though he also has met with cases in which it failed to produce the desired effect, even in doses of 45 grains; and he also reports cases where vomiting and faintness were produced by the internal administration of 45 grains. Nevertheless, he likewise regards sulphonal as an important addition to our list of hypnotics. His experience, in connection with others we have alluded to, show that the drug is not entirely without danger, and that its employment must be commenced with small doses, since certain individuals are more susceptible to its use than others, and that it cannot be looked upon as an invariable hypnotic.

Dr. Schotten also relates in the *Therapeutische Monatshefte* for December, 1888, the case of a woman, 45 years of age, who had been in the habit of taking 45 grains of chloral nightly for insomnia, who received in the evening, at half-past eight, 30 grains of sulphonal. No satisfactory sleep was obtained, and on the following morning she complained of great fatigue. On the second night the same dose was repeated at eight o'clock, and still without effect. On the third evening, 45 grains of sulphonal were administered. This time sleep was produced, but on the following morning she complained of great fatigue, inclination to sleep, sinking of the upper eyelids, slow, indistinct speech, and difficulty of moving the tongue. At the same time there was severe headache, bitter taste in the mouth, and loss of appetite. This condition of affairs lasted for four days, although no further administration of chloral or sulphonal was given; and while there was the constant sleepiness in the day-time, yet the rest at night was very much broken. Four days after the last dose of sulphonal, an eruption, which closely resembled measles, appeared, and which, commencing on the head, finally covered the entire body. This was accompanied by heat and burning of the skin, but no implication of the mucous membranes. With the appearance of this exanthem the other symptoms rapidly disappeared, and although two days later the eruption commenced to fade, traces of it lasted for over two weeks. The remarkable points in this report are, that, in the first place, sulphonal should be given for three days without producing sleep, and yet the third day should lead to the appearance of severe subjective and objective symptoms, lasting for four days after its discontinuance; in the second place, that an eruption should have appeared four days after the last dose of the drug. This prolonged action of sulphonal is without doubt to be attributed to its great insolubility.

Numerous investigations have recently been made as to the chemical changes produced by sulphonal, especially in its relation to its influence on the elimination of nitrogen and the changes which sulphonal undergoes in the economy. Dr. W. J. Smith has found

that the excretion of nitrogen, and, as a consequence, the destruction of albuminous material in the organism, is not influenced by the administration of sulphonal, while Kast (*Therapeutische Monatshefte*, November, 1888), from an experimental investigation of the subject, has determined that in moderate doses sulphonal is decomposed into soluble organic sulphur compounds. It therefore differs in this respect from the large number of allied substances, the other disulphones, which pass through the organism without undergoing change. He further finds that the excretion of sulphuric acid in the form of sulphates in the urine is not increased by the administration of sulphonal, a point which would appear to indicate that the organic compounds formed from sulphonal are characterized by great stability. Kast likewise confirms Cremmer and Smith as to the fact that sulphonal is without any influence on the nutritive process in the economy, and that it does not disturb digestion in the stomach and intestine.

A NOVEL TREATMENT FOR HEMORRHAGE FROM THE LUNGS.

THERE is no fact better established in physiological therapeutics than the power of the alkaloid atropine to contract the capillaries. Ergotin has been long used for this purpose in the treatment of hemorrhage from the lungs, so that it seems rather odd that no one has assayed the use of atropine, at least we cannot remember to have read of the alkaloid being employed for the purpose of checking a hemorrhage. At the meeting of the Medical Society of Victoria, on the 14th of last November, Dr. R. A. Stirling narrated a case of profuse bleeding from the apex of the left lung, in which hypodermic injections of ergotin and other commonly used remedial measures had failed to check the hemorrhage, which was sufficiently severe to threaten immediate death by suffocation, but in which the hypodermic injection of $\frac{1}{150}$ grain of atropine at once controlled the bleeding. During twenty-four hours the injections were repeated at intervals of every six hours; then, thinking that the stoppage might have been accidental, the doctor omitted the treatment for twelve hours, with the result of a fresh and severe attack, which was at once controlled by the renewal of the treatment.

Reports on Therapeutic Progress.

DIETETIC TREATMENT OF CHRONIC BRIGHT'S DISEASE.

The proper dietetic treatment of chronic Bright's disease of the kidney is a subject of certainly as much practical importance as its medical management, or the rules pertaining to clothing and climate. It is, therefore, a somewhat remarkable fact that but little, relatively, has been written in regard to it, at least of an accurate kind. Especially is this statement true for the past few years, when so many treatises, articles, and discussions have taken hold of the disease in question, from many different aspects. The pure pathologist has, by means of the microscope, unravelled much that was previously obscure; the physiologist has dealt extensively with the sphygmograph and the effects of increased blood-pressure; and the clinician has discussed fully matters of heredity, etiology, and symptoms, and facts pertaining to urinary analysis, in which he has also been aided by the chemist. Remedial treatment, indeed, has been much studied, but particularly with reference to drugs, to venesection, to clothing, and to climate changes. Meanwhile the subject of dietetic treatment has only been touched upon, as it were, by many writers.

In the *Medical Record* for January 5, 1889, DR. BEVERLEY ROBINSON publishes an important contribution to this phase of the treatment of Bright's disease. He shows that the indications for proper dietetic treatment in chronic Bright's disease vary somewhat, of course, with the form and stage of the renal degeneration, as well as with the nature of the secondary complications which may be present. In each case it is of practical importance to discover, if possible, the probable cause of the actual disease, and the dietetic treatment should be directed more or less in accordance with the discovery made. Thus, if excessive eating or drinking be the obvious exciting cause, considerable limitations as to food and drink seem rational and well ordered. If gout be manifestly present, in an hereditary or acquired form, there are certain aliments and beverages that should be specially prohibited. The three forms of Bright's disease which are generally recognized are,—

1. Chronic parenchymatous nephritis (the large kidney without waxy degeneration).

2. Lardaceous disease of the kidney (waxy kidney).

3. Interstitial nephritis (the small granular kidney).

Dr. Robinson points out that the dietetic treatment of these three different forms of Bright's disease varies, and he considers the methods of treatment of each in detail. All dietary rules pertain to food, drink, and the use of stimulants. In chronic parenchymatous nephritis, the best diet is generally recognized to be an exclusive milk diet.

The reasons given for this preference and which appear to me important, may be enumerated as follows: 1. Milk is easily assimilated, and is, therefore, well adapted to a disease in which digestive disturbances are almost the invariable rule. These disturbances are, generally, as we know, of the nature of dyspepsia, nausea, vomiting, epigastric pains, etc. 2. If a suitable amount of milk be taken daily, it provides sufficient nutriment for the needs and proper support of the economy. 3. An exclusive milk diet forms less urea in the blood than any other form of alimentation. 4. Milk furnishes a large quantity of fluid to flush out the kidneys with, always supposing it is taken at short intervals and in fairly large quantities each time. In this way it increases urinary excretion by continued excessive pressure in the arterial system, and thus helps the dropsy to disappear by degrees.

The objections which are, or may be urged against an exclusive milk diet are: First, it is not tolerated by all patients. Some persons soon tire of it, or get a profound, unconquerable disgust for it. There are a few individuals, also, in whom an idiosyncrasy has much to do with this distaste, and try as we may to get them to take milk in any useful quantity, we are finally obliged to abandon the effort in sheer despair of success. In either of these two contingencies, we are obliged to recur to the use of broths (chicken and veal), beef-tea, light farinaceous food, and other diluents than milk.

As regards beverages, the best is unquestionably pure water, and especially pure spring water. The first great thing to accomplish is, at all events, to have these patients drink much pure water, up to several pints a day, and yet not upset an already weak digestion in doing it. The use of water abundantly as a diuretic in renal disease does not antagonize the principle of giving the kidney little or moderate work to do, as it is a physiological diluent, and does not occasion any irritation of the kidneys. Some other diuretics, among which we may at times place digitalis, are prone to induce this untoward effect, either directly or by increasing heart-action, and contracting the small renal arteries. This is not true, however, of mild alkaline water, soda-water, or cream of tartar solution with lemon in it (Imperial drink). By these different means a marked flow of urine is obtained and the kidneys are kept continuously flushed, so that the masses of degenerated epithelium which tend to clog the tubes are gotten rid of. In this manner any remaining congestion of the gland will be relieved by secretion, and the system will be cleared of impurities which previously had been retained. By the passage of a large quantity of fluid through the kidneys we also reduce to a minimum (dilute?) that nitrogenous excess which finds its way out through these organs, and gives rise to many sources of irritation. If at the same time we cut off the materials of urea and uric acid, we are doing the best we can accomplish (Dickinson).

Tolerance of milk, however, when pure milk is objected to, may often be obtained if we mix it in certain variable proportions with lime-water, carbonic water, Vichy, etc., or give it in the form of peptonized milk or koumyss. Whenever milk is well supported by the stomach it may be taken either skimmed or unskimmed,—that is to say, with or without the cream. Unskimmed milk is advantageous, says George Johnson, because it prevents constipation. It is desirable, according to Tyson, because its nitrogenous principle, the casein, is present in a proportionally small amount as compared with skimmed milk. On the other hand, the stomach is often intolerant of rich milk, and the fatty elements in the cream are apt to occasion numerous dyspeptic symptoms, such as headache, heartburn, diarrhœa, etc. Under the circumstances the milk had better be skimmed rather than abandon it as the main article of diet. Even though we are obliged to do this, or to adopt many different methods to make milk tolerable to irritable stomachs, we should try all means which offer any chances of success before abandoning it altogether. Sufferers from chronic Bright's disease are so frequently affected with gastric symptoms which may prove both obstinate and distressing, that it will scarcely do to give up milk diet without a prolonged struggle to avoid it if possible. The probabilities are that many dyspeptic symptoms are occasioned by vicarious elimination, through the mucous membrane of the stomach, of impurities which normally are secreted by the kidneys. This is proven by the fact that the gastric secretions are at times mingled with the products

of decomposed urea. Of course, when this is the case, relief should be sought, partly at least, in suitable diet, and iced milk in small quantity can occasionally alone be taken. If this fail us, nutritive enemata must be resorted to in order to sustain the patient until incessant vomiting be stopped. When taken, milk may be either warm or cold, as best suits the patient. It is usually found that if great irritability of the stomach be present, it is more acceptable cold, in small quantities and at short intervals. If it form the exclusive diet, it must be taken in fixed quantities and at specified hours. From a few ounces to half a pint, or one pint, may be taken every two or three hours by an adult. From two and a half to four quarts in the twenty-four hours are sufficient to prevent bodily loss and to keep its condition about stationary.

In children affected with chronic Bright's disease milk diet acts extremely well, and while they are upon it there is no need for them to have any other food or drink. Of course they will take less milk than adults in proportion to their ages. Clinically there is evidence to show that exclusive milk diet (or nearly so) reduces notably the quantity of albumen excreted by the kidneys.

In relation to the milk diet, experiments have shown that to produce a diminution of albumen in Bright's disease milk must be given, not to supplement, but to replace the articles of ordinary diet. The author concludes that the effect of the milk diet is not merely apparent and due to albumen being more than ordinarily diluted, for ordinary diet, with an equal quantity of water, did not produce the same result. If, however, while on the milk diet symptoms of general anæmia, exhaustion, etc., become manifest, and especially if the quantity of albumen in the urine be small, the exclusive milk diet should be supplemented by a due proportion of vegetable food. Finally, even this diet may become objectionable, as it obliges the stomach and intestines to perform more work than they can properly accomplish, and whenever this condition is tolerably evident a moderate amount of boiled or roast meat should be allowed daily. As a rule, all stimulants are injurious in the dietetic treatment of chronic parenchymatous nephritis. In any form alcohol increases the work of the kidneys, augments the quantity of urea in the blood, and promotes increased excretion of albumen. Claret and the light French and German wines are, perhaps, the least objectionable. Gin, or whiskey much diluted, are occasionally of value as diuretics, though even a small quantity of certain wines, like Moselle, Madeira, or Champagne, will increase immediately and considerably the quantity of albumen excreted. Madeira in this respect is considered as the most injurious.

In regard to the question of using alcohol, it should be continually borne in mind that its consumption, by the extra work it imposes on the kidneys, is opposed to the principle of lessening as much as possible the labor of the altered gland-tissue. It should also be remembered, particularly among the lower classes, that excess in taking alcohol has been believed by many distinguished observers to be one of the most frequent causes of albuminuria. If this view be only at times correct, it may be inferred in certain cases that a moderate employment of alcohol may tend to "perpetuate and aggravate" the disease when it is obviously due to other causes. It is further proven by clinical experience that alcoholic stimulants produce greater and more pernicious effects when there are considerable renal changes than would result from an equal quantity given when the kidneys are in a normal condition. Despite all these objections, conditions may arise when alcoholic stimulants are imperatively called for. Such instances are those which occur whenever great exhaustion is present, as by reason of blood-losses from albuminuria; and in instances in which there is profound anæmia, particularly of the brain. This condition is often, as we know, the accompaniment of threatened uræmic symptoms,—viz., convulsions, dyspnœa, etc., when the economy is literally poisoned by retained urinary excreta. Under these circumstances alcoholic stimulants are needed, and may be given as freely as the occasion seems to require. In some instances, no doubt, the uræmic attack may be aborted, owing to the fact that more blood is sent to the brain, which is deprived of it, and the heart, which is beating rapidly and feebly, is strengthened, and great temporary relief is thus afforded. In these cases we should scarcely look for much help from malt liquors or wines, but must place our reliance upon the strongest alcoholic liquors,—viz., brandy or whiskey.

The dietetic treatment of lardaceous disease of the kidney depends somewhat upon its cause, if it continues to be present. If it be phthisis, abundant and nourishing food should be given, of which milk and cream should form a large portion, but meat should

not in these cases be denied, while alcohol should be allowed in moderate quantities, and good wine is often a great boon to the sufferer. In this manner the loss the general system suffers from profuse suppuration is in some degree compensated. From a theoretical stand-point, a good beef extract is useful, as an addition to daily diet, by reason of the saline constituents of beef which it supplies in a concentrated form. When the disease has disappeared which has been the cause of the renal changes, the dietetic regimen should not differ materially from that which I have counselled for parenchymatous nephritis.

The dietetic treatment of interstitial nephritis should have mainly in view,—1. To maintain the integrity of the blood by preventing the accumulation of urea and allied compounds. 2. To compensate the loss by albuminuria.

As regards the food, we should be particularly careful in its choice, for the reason that the patient's appetite is often good, and nutrition may be kept up without causing unnecessary risks. It is all-important to bear in mind that the urea which accumulates in the blood is largely formed from nitrogenous food, and is increased in proportion to the amount of this kind of food taken. Of course the more urea accumulated, the more the kidneys are called upon to work to eliminate the excess through their excretion. While it is neither possible nor desirable to prohibit all nitrogenous food, yet it is evident the amount allowed should be very moderate. Milk and cream should be supplied abundantly, and the other necessary elements of food should be obtained from the vegetable kingdom, it being especially advantageous to dilute milk with Vichy water. Alcoholic stimulants should be avoided as far as possible. Malt liquors, if the case be a gouty complication, should be strictly prohibited. The light wines may occasionally be permitted, but then only sparingly. In the treatment of uræmia it is often indicated, however, to give the stronger alcoholic stimulants promptly. Of these, gin and whiskey are perhaps the least injurious.

CHOREA AND ITS RELATION TO RHEUMATISM.

At the meeting of the Royal Medical and Chirurgical Society, January 8, 1889, Dr. W. P. Herringham read a communication on eighty cases of chorea, with antecedents, family history, state of the heart, and subsequent history, of which the following is an abstract (*Lancet*, January 12, 1889):

Antecedents.—Acute rheumatism preceded the attack in nineteen cases, immediately in four, at some interval in fifteen. It accompanied the chorea in two cases. Pains in the joints preceded the attack in fifteen cases, and accompanied it in one case. The total number of cases in which rheumatism of some sort could be traced was thirty-seven. Injury, shock, or violent outburst of emotion preceded the attack in six cases, the interval never being greater than two days. Hard mental work or worry were found in twenty cases. These influences were not mutually exclusive, since all those classed under injury, shock, or emotion could alone be considered as exciting, the others only predisposing, causes. In twenty-five cases none of them could be traced, and of these fourteen were first attacks. Nearly all the patients were delicate. Headaches and indigestion were the most common complaints.

Family History (calculated from parents, brothers, and sisters only).—Rheumatic fever had occurred in twenty-five out of seventy-five families, seventeen of which belonged to thirty-four patients of the rheumatic classes, and the remaining eight to forty-one in whom there was no history of rheumatism. Chorea had occurred in twelve families, nine of which were also rheumatic.

State of the Heart (throughout).—Natural in ten; uncertain (*i.e.*, doubtful endocarditis) in twenty-five; certainly diseased in twenty. Signs of disease developed during observation in eleven cases, and signs which were at first present vanished during observation in four. Thirty-seven cases were seen again, usually at an interval of two years or over. For the most part they presented the same state as before. Of the twenty-five doubtful cases, two had become healthy, seven appeared certainly diseased. Of the eleven cases which developed signs during the attack of chorea, five were re-examined, and of these two were natural, while three gave good evidence of disease. This last was important as tending to show direct influence of chorea upon the heart. The following conclusions were drawn: 1. That a large number of choreic patients were liable to rheumatism. 2. That choreic patents were nearly always of a delicate constitution. 3. That chorea was sometimes directly caused by emotion. 4. That chorea might cause permanent heart-disease. 5. That it also gave rise to signs of heart-disease which were not permanent.

This paper was followed by one from the pen of DR. ARCHIBALD E. GARROD, on the "Relation of Chorea to Rheumatism," with observations on eighty cases of chorea. The conclusions arrived at in this paper were based upon eighty consecutive cases of chorea, sixty-one of the patients being females, and only nineteen males. Forty-nine were suffering from first attacks. The average age of the female patients was considerably higher than that of the males. There was a history of rheumatic fever in the near relatives of twenty-six patients, of rheumatism with swollen joints in those of three, and of rheumatism in three more, making a total of thirty-two, or forty per cent., with rheumatic family histories. It was pointed out that the tendency to chorea was far more marked in some rheumatic families than in others, and examples were quoted illustrating this point. The total number of cases in which there was a personal history of rheumatic manifestations other than endocarditis was thirty-six, or forty-five per cent. In fifteen of these there was a definite personal history of rheumatic fever, in nine of rheumatism with swollen joints, in one of joint-pains, confining the patient to bed, and in nine of joint-pains only. One patient had nodules, but no arthritis, and one had acute pericarditis. It was shown that the same patient sometimes had an attack of chorea with joint-pains only, and a later attack with well-marked rheumatic fever. Evidence was brought forward to show that some cases in which there was no family history of rheumatism, and no personal history of joint-pains, were, nevertheless of rheumatic origin, cases being quoted of rheumatic patients who had previously suffered from chorea, of the development of erythema nodosum and arthritis in the course of apparently non-rheumatic chorea, of chorea with endocarditis and nodules without joint-pains, and of the association of acute pericarditis with chorea. In fifteen cases the onset was ascribed to fright, but in some instances inquiry showed that the fright followed the onset of the chorea. A definite murmur was heard in forty-five cases, or 56.25 per cent., and in six others the first sound was murmurish. The percentage of murmurs was naturally highest among those with personal histories of rheumatism, but was lowest among those with family history only. In some instances the murmurs developed under observation. The opinion was expressed that the endocarditis of chorea was probably always of rheumatic origin, but that we had no evidence to show that all chorea was of rheumatic origin, a considerable number of cases being probably due to emotional and other causes.

DR. CHEADLE felt surprised that Dr. Herringham had limited his inquiries in the subject of rheumatism to the presence of arthritis. Statistics concerning rheumatism compiled from the consideration of that symptom alone must be inadequate. In many cases the arthritis was extremely slight, or it followed the fever. He related the case of a child admitted under his care at St. Mary's Hospital with chorea; there was no family or personal history of rheumatic fever, no cardiac bruit, and no nodules. When the child had been in hospital four days, transient swelling of the right wrist occurred, followed by an even slighter attack in the left wrist. Many such cases among the poor were frequently overlooked. The presence of subcutaneous nodules, of peri- and endocarditis and erythema occurring together, afforded good cumulative evidence of rheumatism. Fright was an equally effective cause in the rheumatic and non-rheumatic cases. He related two cases in which chorea had been cured, but mental emotion brought on an acute second attack in each. It was a matter of common observation that rheumatic children were delicate, but it was an open question whether the nervous instability was produced by the rheumatism, or whether they, so to speak, ran together. The report of the Collective Investigation Committee of the British Medical Association showed that headaches were common in this affection. He believed that a much larger proportion of cases of chorea was rheumatic than was generally supposed, and the absence of a history of arthritis was not to be taken as proof that the case was of non-rheumatic origin.

DR. A. E. SANSOM said that his experience led him to believe that there was a fright-chorea dissociated from rheumatism. He was prepared at the same time to admit that the tendencies to rheumatism were difficult to define, and cases apparently non-rheumatic often became undoubtedly rheumatic later on. He had met with some cases, and he detailed one, in which fright was the determining cause and rheumatism could be excluded altogether. Speculating on the relations between fright-chorea and endocarditis, he thought that the excessive cardiac action which followed the preliminary blanching of terror, might be a factor in the causation of chorea, either directly or indirectly; the vio-

lent palpitation occurring in a child might, he thought, set up inflammation of the delicate valve-curtains. Two forms of endocarditis should be recognized in association with chorea,—the ordinary rheumatic valve thickening, and a "beading" of the valve-cusps with small papillary elevations much resembling the lesions produced artificially, and described at the last meeting of the British Medical Association.

Dr. Sturges felt sure that there was a real relation between chorea and rheumatism, but was doubtful as to its amount and extent; he thought there was a tendency to exaggerate this relationship. Dr. Herringham had only been able to trace a direct and immediate connection between rheumatism and chorea in four cases out of eighty, and it was often necessary to seek far in order to find the rheumatic element. He contrasted this with fright, the chorea following which came on usually without an interval. Great divergence of opinion existed on the subject abroad; in Germany rheumatism was regarded as a small and trivial element in chorea, whereas the French thought that chorea was a mere manifestation of rheumatism. Osler, of the United States, had put together many cases, and had found practically no rheumatic proclivity at all. Discussing the joint-pains in connection with chorea, they were sometimes rheumatic and sometimes not, and he felt there must be some deeper relation between chorea and the joint affection. With regard to treatment, he divided chorea into two stages,—the first emotional and often overlooked, the second motional and obvious. If taken early during the first stage, appropriate treatment could arrest the disease.

Dr. Barnes alluded especially to the important relationship existing between chorea and pregnancy, and related a case where a child had chorea and was cured, but, in later years, becoming pregnant, the chorea returned with increased severity. The pregnant state was one of high nervous tension and strong emotion, and this, perhaps, explained the outbreak. Chorea, if evoked by pregnancy, often tended to insanity.

Dr. Stephen Mackenzie thought that the evidence lately had become increasingly strong that rheumatism played a great part in the production of chorea. He thought that the differences noticed in the valves by Dr. Sansom were explicable by the relative age of the lesions, the small beaded vegetations being much more recent. He referred to the gravity of chorea when occurring in pregnancy, but thought that some factor other than gestation must be at work to produce it.

Dr. Robert J. Lee regarded chorea as a symptom rather than a disease; though it might coexist with rheumatism, yet there was no evidence to show that the two bore to each other any other relation of cause and effect. He did not think pregnancy could be looked upon as a cause of chorea, for the latter occurred so extremely rarely as a complication. Emotional influences, he felt sure, played a considerable part in its production.

Dr. Herringham, in reply, said he had restricted his inquiries to arthritis, because the evidence of other more equivocal data would be rejected by the sceptical. He could only look upon rheumatism as a collection of symptoms, and, in fact, all other diseases could be included in the same definition.

Dr. Garrod, in reply, said it would be interesting if Dr. Sansom could adduce cases where endocarditis alone had followed fright. A good deal of the discussion had turned upon what was really meant by rheumatism; he himself regarded it as a general disease, of which arthritis was but one manifestation.

A NEW METHOD OF TREATING GONORRHŒA.

During the last few years considerable progress has been made on the subject of gonorrhœa. The discovery of the specific cause—the gonococcus of Neisser—has thrown a great deal of light upon the nature of the disease. It has made it possible to separate the same from other similar, yet vastly different, processes, and we are enabled to test the multitude of remedies used heretofore by their direct action against those microbes, etc. On the other hand, the development of endoscopical methods has opened a wide field for research, more especially in regard to the chronic forms of gonorrhœa, and our ways and means to treat these conditions have been materially improved.

Unfortunately, however, the treatment of the acute stage remains as unsatisfactory as ever. The composition of the different fluids which are ordinarily used for injection seems to make very little difference. In the *Medical Record* for January 19, 1889, Dr. Joseph Zeisler describes a plan of treatment, the credit of which he gives to Dr. C. S. Pixley, of introducing dry powders into the male

urethra. The instrument which he has devised for accomplishing this consists of three principal parts, two of which resemble very much the original form of the urethroscope, as devised by Désormeaux, Fenger, and others,—namely, first, a canula, with a cup attached to one end; second, an obturator, to facilitate the introduction; and third, a hollow spiral, whose object is to convey the powder through the canula into the urethra. The canula has, in the present form of the instrument, a length of six inches and a diameter of about one-fourth inch (corresponding to No. 20 of the French gauge). The cup has a capacity for about two drachms of dry powder; a narrow bridge with a set-screw is attached transversely to the cup, in order to fasten the spiral in its proper position. The length of the spiral corresponds exactly to that of the canula, so as not to protrude beyond the lower end of the same when fully inserted; the upper end of the spiral is formed by a milled head, on the top of which is an arrow, indicating the direction in which the spiral should be turned. Just below the milled head is a groove, into which fits the set-screw. Below this groove, to what may be called the neck of the spiral, is attached an agitator, which, during the turning, continually moves the powder towards the spiral. The obturator, which needs no further description, transforms the canula practically into a solid, straight, urethral sound.

The instrument could, of course, be easily manufactured in different sizes, although the present (No. 20) will answer for most cases. The length of six inches will allow the introduction up to the membranous urethra only, which, in acute cases, where the inflammation has not invaded the deeper parts, will be all sufficient. With a slight modification, increasing the length of the canula and spiral, and placing the cup under an angle, the instrument could also be adapted for the purpose of treating the deepest parts of the urethra.

Mode of Operation.—The patient is directed to evacuate his bladder perfectly; next the urethra is thoroughly washed out with a weak solution of permanganate of potassium (1 to 10,000), or some other suitable alkaline solution; this may be best done by the well-known retrojector. Now the urethra is dried as perfectly as possible by gently stripping the penis with a clean towel. The patient is then placed in a recumbent position, and the instrument, with the obturator inserted, is lubricated (best with glycerin), and gently introduced into the urethra back to the pars membranacea. The obturator is now gently withdrawn, so as to cause the least possible irritation of the mucous membrane, the spiral substituted therefor, and fastened by the set-screw into its place. The medicament is now placed into the cup, and by constant turning of the spiral in the direction indicated by the arrow, conveyed through the canula to the deep urethra. At first very little resistance to the turning of the spiral is felt; as soon as the powder begins to be deposited in the urinary channel, the operator will experience a decided resistance. The instrument may now be slowly withdrawn, and in this way the whole urethra filled with the powder. The operator can easily regulate the amount of powder he wishes to introduce. It is not possible to pack the urethra too firmly, as the instrument is in a certain measure self-regulating. The operation completed, a small quantity of the powder is placed around the meatus and the glans penis, to keep these parts as dry as possible from the ensuing discharges, and the patient directed to keep the same always covered with dry absorbent cotton.

If properly executed, the whole operation will cause very little inconvenience to the patient; by the previous use of a cocaine solution it can be made absolutely painless. The patient will, during the next few hours, naturally have a sensation of fulness; by and by, as the powder is dissolved and eliminated by a profuse watery discharge, the urethra will be emptied within four to six hours.

The number and frequency of operations will depend on the gravity of the symptoms; one application daily will usually be sufficient during the first few days; later it may be done only every second day, or even at longer intervals.

In the composition of the powder, boric acid has been adopted as the basis, to which may be added different drugs, to meet the requirements of the case. A long series of experiments will probably be necessary to finally determine what combinations may be of most value. For the present, the following suggestions may be useful: In the beginning the mildest possible powders should be used, such as pure boric acid, or, as Dr. W. E. Morgan recommends, calomel, 1 part; bismuth subcarbon., 2 parts; boric acid, 12 parts. With the decrease of inflammatory symptoms the powder can be made more astringent by an addition, in proper proportions, of alum, subnitrate of bismuth,

hydrastin, etc. Reports of the poisonous effects of boric acid after packing the vagina have lately been published; but with the comparatively small quantity of the acid used in the urethra no such result seems here possible, except in rare cases of idiosyncrasy.

While Dr. Zeisler acknowledges that this method of treatment has been too recently introduced to warrant success, yet, even on theoretical grounds, it has much to commend it. In the first place, it is based upon antiseptic principles. The inflamed and suppurating mucous membrane remains in contact with a mild yet powerful antiseptic or astringent agent for several hours in succession; this will surely appear more effective than the occasional use of an injection during a few minutes. The diseased urethra is in this way placed under nearly the same conditions as any suppurating cutaneous surface. The purulent discharge will immediately be made innocuous, and its infecting influence upon uninvaded parts will be checked.

From the actual observations made, the following experience has been gathered. It is desirable to begin the treatment as early as possible. The acute inflammation forms no contraindication against the use of the instrument. The effect of the first few powder applications is to deprive the secretion of its purulent character and to change it to a mucous fluid; a few more treatments will result in rendering the discharge only serous in character, when a mild astringent injection will terminate the course of the disease in a few days. The duration of the disease has in this way in all cases been materially shortened. Chordee, usually so troublesome, has in every case been greatly relieved. Epididymitis, cystitis, stricture, or any other complication, was not known to follow any of the cases treated in the foregoing manner. While the benefit derived from the treatment was not always equally great, there was never the least harm done by it.

MORBID CHANGES CAUSED BY ANTIPYRIN, THALLIN, AND ANTIFEBRIN.

Dr. Konstantin D. Pisemsky, of St. Petersburg ("St. Petersburg Inaugural Dissertation," 1887, p. 48; analyzed by Dr. V. Idelson, *London Medical Recorder*, December 20, 1888), has carried out in Professor N. P. Ivanovsky's laboratory three series of experiments on healthy adult rabbits and dogs, in order to study morbid changes arising in the animal system under the influence of large doses of the said three drugs, so extensively used in daily practice all over the world. The outcome of Dr. Pisemsky's researches, presenting a considerable practical interest, may be summarized as follows:

I. *Antipyrin.*—[The drug was invariably introduced under the skin,—*a*, in rabbits, either in the daily dose of .5 gramme (7½ grains), death ensuing on the sixteenth to thirty-first day; or in that of 1 gramme, the animal dying in several hours; or in that of 1.5 gramme, death taking place one and a half hours after the injection; *b*, in dogs, in the daily dose of 1 gramme, the animals dying on the fifteenth and twentieth day; or in that of 3 grammes, death occurring on the next day after a single dose.] The most prominent alterations were these: 1. Intense congestion of the brain and its meninges, with some serious effusion into the cerebral ventricles. 2. Intense congestion of the lungs, with hypostases, the organs having a bright red (as if "highly arterialized") color. 3. Dryness, and often a very considerable contraction of the spleen. 4. Congestion of the kidney, sometimes with initial inflammatory lesions. 5. Congestion of the liver, somewhat less frequent comparatively with other changes. 6. The numerical strength of red blood-corpuscles in the beginning increases, but later on sinks, the decrease possibly depending upon a progressive exhaustion of the system. 7. The body's weight steadily falls.

II. *Thallin.*—[The drug was used always hypodermically,—*a*, in rabbits, in the daily dose of .2 gramme, death ensuing on the sixteenth to twenty-eighth day; or in the dose of .4 gramme, the animal dying on the next day after the injection; *b*, in dogs, in the daily dose of ⅓ gramme, death occurring on the twenty-fifth to twenty-eighth day.] 1. Thallin displays a by far more powerful irritant action on animal tissues than antipyrin. 2. In the brain, lungs, spleen, liver, and kidneys there are detected, side by side with intense congestion, quite distinct inflammatory and degenerative changes (in initial stages). 3. The numerical strength of red blood-corpuscles at first somewhat decreases, then temporarily slightly rises, to subsequently fall steadily in a considerable degree. 4. The body's weight is diminished more rapidly and more considerably than in the case of antipyrin.

III. *Antifebrin.*—[The drug was adminis-

tered internally, through a gastric tube, to four dogs, in the daily dose of 2.5 grammes, the animals dying on the twelfth, fifteenth, sixteenth, and twentieth day of the experiment] 1. Morbid changes are subject to more pronounced individual variations, comparatively with the former two drugs. 2. The brains and lungs are less congested. 3. The liver is sometimes congested, sometimes decidedly anæmic. 4. The spleen is sometimes dry, sometimes normal. 5. The kidneys are more or less congested. 6. The numerical strength of red blood-corpuscles decreases gradually and steadily from the very beginning. 7. Their volume remains unchanged (while under the influence of thallin, and still more under that of antipyrin, it is increased). 8. There is observed a post-mortem formation of strikingly dense, voluminous, dark blood-clots in the cardiac cavities (which phenomenon is said to be entirely absent in cases of poisoning by antipyrin and thallin).

IV. *General Conclusions.* — 1. Antipyrin, thallin, and antifebrin, when used in large doses, give rise to profound disturbances in the general systemic nutrition, as shown by progressive emaciation and prostration, with falling-out of hair and development of cutaneous ulcers, ending in death. 2. Of the three drugs, thallin appears to be the most and antifebrin the least injurious to the organism. 3. The morbid anatomic lesions, as found at the necropsy in fatal cases of the poisonings under consideration, cannot sufficiently explain the actual cause of the animals' death.

THE FUNCTION OF THE STOMACH, AND THE THERAPEUTIC RESULTS OF WASHING OUT THE STOMACH IN INFANTS.

Leo has investigated one hundred and thirty-four cases in infants, by washing out or sounding the stomach, and reported his results at a recent meeting of the Berlin Medical Society (*Medical Chronicle*, January, 1889). The sound has an internal circumference of five millimetres and an external of eight millimetres. When the stomach contains anything, it is usually spontaneously emptied; at other times the fluid contained in the lower part of the tube was examined, always undiluted, because small quantities of matters may escape observation when diluted, and an acid reaction may be changed on dilution to a neutral one. Thirty-five healthy children were examined, and among them twelve newborn, from two hours to eight days old. The reaction after human milk was always neutral or feebly alkaline, after cow's milk slightly acid or slightly alkaline. Free hydrochloric acid could be found in the full stomach only after the lapse of an hour. Sometimes lactic acid was found, but never fatty acids. In the fasting stomach hydrochloric acid could almost always be found. From the fact that free hydrochloric acid is only found at the end of digestion, or in the empty stomach, it by no means follows that none is produced during digestion; it is only partially neutralized, partly transformed into acid salts. This acid-combining power of milk is decisive for the use of milk in ulcer and hyperacidity. Propeptone was almost always found in the fasting as well as in the full stomach. Rennet ferment was always present; once, where it was doubtful, its enzyme was present. It was also found when hydrochloric acid was absent, and sometimes in large quantities. In suckling infants the stomach contents are not unfrequently streaked with rusty altered blood-coloring matter, which arises not from blood swallowed intrapartum, but probably from slight gastritis, as a result of the still unusual digestive processes. At a later age this phenomenon disappears.

How long the milk remains in the stomach, and whether the emptying process takes place in gushes, were not ascertained. At all events a considerable quantity had passed into the stomach at the end of half an hour. The time when all is got rid of is subject to variations according to age, and the kind and quantity of food taken. The stomach in breast-fed children during the first week is found empty at the end of half an hour, while in older ones a considerable quantity of food remains at that time. The milk extracted after a certain time was examined for propeptone and peptone, and compared with a sample of the milk given. After resting in the stomach for half an hour a considerable increase was found in both propeptones; peptone was only present half an hour later. Peptonization and the secretion of acid consequently take place in the stomach. The child's stomach serves chiefly as a reservoir for milk, the whole would be peptonized in the intestine. The clotting of the milk might be supposed to be a preliminary step essential to its digestion, but experiments with trypsin on clotted and unclotted milk gave no essential difference. A part of the micro-organisms entering the stomach are certainly hindered in their development by the acid. Whether the stom-

ach acts as a kind of bulwark against the penetration of organisms future work must show.

Fifteen minutes after food the reaction is always distinctly acid. Free acid is, however, not present till the end of digestion, but always in the fasting state. The quantity of acid secreted is considerably less than in adults.

The pathological conditions were studied in one hundred and four cases, sixty of acute dyspepsia with or without vomiting and with or without fever and intestinal mischief, twenty-two of expressed cholera infantum, sixteen of gastric catarrh, six of habitual diarrhœa without disturbance of the appetite. The reaction was always acid except in some breast-fed children. Volatile fatty acids, lactic acid, acetic and butyric acid, were frequently present. The quantity of the latter may be very considerable. In one case the total acidity was equal to sixty cubic centimetres of one-tenth normal soda solution and fatty acids formed two-thirds of this. Not seldom an abnormally high percentage of hydrochloric acid was present, particularly in subacute dyspepsia. Pepsin or pepsinogen was found in the majority of cases; rennet ferment was always present, therefore the milk was always clotted. One of the most constant accompaniments of dyspepsia in infants Epstein has pointed out,—namely, the lengthened stay of the milk in the stomach. In one case Leo found twenty cubic centimetres of highly acid milk, containing much fatty acid, after seven hours. A similar condition was found also in chronic dyspepsia and in diarrhœa. This atony of the stomach is apparently not the cause but the result of the disease, for the slowing of the emptying process remained in several cases days after all other subjective and objective symptoms had disappeared. Tough mucus is present frequently in both acute and chronic dyspepsia. In two cases there were large coagula, consisting of mucin, in which epithelium, yeast-cells, and bacteria in large quantities were enclosed. On the introduction of the sound, gas escapes frequently, and also in healthy children.

Two points are to be insisted upon,—1, it is easy to understand from these experiments why in dyspepsia of children hydrochloric acid either is without effect or acts injuriously; 2, the unsuitability of the administration of pepsin. On the contrary, the author's experiments show the benefit of washing out the stomach, because it is a certain means of removing the contents and compensating a dyspepsia, and is a handy method unattended by danger. Water, or water with a few drops of a twenty per cent. alcoholic solution of thymol, was employed, chiefly for washing out. Diluted milk or milk gruel is the best diet, in small quantities. The result is generally very favorable. Often one washing out suffices; in many, two; rarely seven were required. Vomiting ceases in a surprising way and appetite returns. The best results were obtained in acute gastritis, where frequently after one washing out fever and fits ceased. Less favorable were the results in cholera infantum, but always satisfactory, likewise in cases of chronic gastritis, with or without intestinal affection. Cases of habitual vomiting gave very good results, and in obstinate diarrhœa the thymol solution proved very serviceable.

Baginsky agreed with Leo as to the favorable results obtained from washing out, but it is to be avoided when the peritoneum is affected, and in cholera when collapse threatens, because the latter is apt to follow immediately the use of the tube. It is a sovereign remedy in habitual vomiting after weaning, in atonic states of the intestine, as in rickets, and also in many cases of chronic dyspepsia.

Hensch had in collapse of cholera obtained very favorable results from repeated subcutaneous injections of common salt solution.

PILOCARPINE IN THE TREATMENT OF BRIGHT'S DISEASE.

In the *Lancet* for December 22, 1888, Mr. J. G. Marshall reports the case of a young man, aged 19, which illustrates in the most striking manner the value of pilocarpine in the reduction of œdema and dropsy from Bright's disease. When Mr. Marshall was called to the case, he found the patient propped up in bed, and dropsical from head to foot; his eyelids, which were distended with effusion, completely closed the eyes. His face was livid, and the swollen condition of the cellular tissue of the neck made it almost as broad as his shoulders. He coughed incessantly, there was copious intrathoracic effusion, and the subcutaneous tissue all over the chest was "doughy" to the touch. His abdomen was as big as a barrel, and there was extensive œdema of the genitals. His legs and thighs were enormously swollen, and

water was exuding from them. He was passing a very small quantity of urine, which was of a dirty color and loaded with albumen.

As a last resource, Mr. Marshall administered subcutaneous injections of hydrochlorate of pilocarpine, following it the next day by two other injections of ¼ of a grain each, one in the morning and the other late in the afternoon. He covered the patient with blankets after each dose. The first effect was a flushing of the face, the saliva was secreted copiously, and within five minutes he broke out into a profuse perspiration. After the first injection he expressed himself as relieved, and he certainly coughed less. His appearance on the next day was much improved; he had passed a fair night, and the dyspnœa was lessened. The administration of two injections daily was continued for three or four days, and after each administration he sweated most profusely. As the patient became very faint after the injection, to counteract this a good dose of gin and water was given before the next one, and this was repeated each time afterwards, when he never complained of faintness. Vomiting also occurred, once or twice severely, which led to the dose being reduced to ⅓ of a grain, which was injected daily for nine or ten days. The improvement which commenced early was well maintained. At the end of a week he could sit up in bed, the cough was much less, the thoracic effusion had completely subsided, and his arms and neck were becoming less œdematous. At the end of a fortnight the upper parts of his body were free from effusion, but the abdomen was still much distended, and it hardly seemed possible that an accumulation could be gotten rid of which at one time threatened to rupture the skin, and which it seemed that nothing but tapping could relieve. ⅓ of a grain on alternate days was kept up for a fortnight. He was then passing his usual quantity of urine, the albumen much diminished in quantity, and there remained but a little swelling of the abdomen and legs. The injections were continued till the remaining dropsy had subsided. The improvement was maintained, and, under a diet of plenty of milk and the administration of steel and convallaria majalis, he was able to go out of doors and enjoy life with comfort. Mr. Marshall states that he has had good results from the use of an infusion made from the leaves of jaborandi, and drunk hot like ordinary tea; but the drawback appears to be the nausea so easily excited in these cases.

ETHER VAPOR FOR TINNITUS AURIUM.

In a paper read before the Cincinnati Academy of Medicine, Dr. J. E. Boylan has reported a case of tinnitus aurium in which great improvement followed the use of ether, insufflated in the form of vapor through the Eustachian catheter. The patient was a man 40 years old, who had suffered from chronic otorrhœa since childhood. After the first application of the ether very carefully carried out, the patient returned much elated; the noises, previously almost continuous, had ceased shortly after the application, and did not return for six or eight hours. After the second application of the ether, relief was experienced for double this period. The symptoms continued to yield to the treatment, and the patient obtained a rest at night such as he had not known for a year. In order to satisfy himself that it really was the ether vapor that was benefiting the patient, Dr. Boylan substituted water upon two occasions; but this change was followed, in both instances, by a complaint that the noises had been severe and almost ceaseless. Upon another occasion, when the ether in the bottle used had become almost exhausted, the treatment had very little effect; but, after replenishing the bottle, the good results were again immediately manifest. The patient had been treated for over two months when the report was made; his general condition was much improved; the noises, which were only discernible at intervals, were slight and of a totally different character.—*Druggists' Circular*, January, 1889.

BUTYLCHLORAL IN TRIGEMINAL NEURALGIA.

There are but few remedies which exert their action on a special division of the nervous system alone. According to Dr. O. Liebreich, butylchloral illustrates an exception to the general rule, since he claims that, when administered internally in doses of from 15 to 45 grains, it produces anæsthesia in the region supplied by the trigeminal nerve. He therefore has employed it—and he claims with success—in neuralgic affections of the trigeminal nerve, it serving to reduce facial pain dependent either upon rheumatism, traumatic pain from inflammation of the pulp of the teeth, or periostitis, while it may likewise serve to reduce the pain experienced in filling the teeth. The taste of butylchloral is extremely disagreeable, and it is highly in-

soluble and needs some special form of prescription. He recommends it to be combined with alcohol and glycerin,—1 part of butylchloral to 2 of alcohol and 4 of glycerin in 240 parts of water.—*Internationale Klinische Rundschau*, December 16, 1888.

THE EFFECT OF GLYCERIN ON THE QUANTITY OF VAGINAL SECRETION.

A paper with this title was read by DR. HERMAN at the meeting of the Obstetrical Society of London, December 5, 1888 (*British Medical Journal*, December 15, 1888). Dr. Herman related observations made to see whether the commonly, but not universally, accepted belief, that the local use of glycerin caused a flow of fluid from the vagina, was correct or not. The observations were made with cotton-wool plugs soaked in glycerin, and with pessaries made of gelatin and glycerin. The amount of glycerin inserted into the vagina was weighed; the discharge from the vagina was weighed, and the amount of vaginal discharge from the same patient when glycerin was not used was also ascertained by weight. The result of the observations was in favor of the following conclusions: 1. That when the secretions poured into the vagina were not abundant the local use of glycerin increased them. 2. That when the secretions poured into the vagina were already abundant the local use of glycerin did not increase them.

DR. CHAMPNEYS asked whether Dr. Herman had estimated the loss on the diapers from evaporation. The conditions were favorable for evaporation, and would confirm the conclusions arrived at in the paper.

DR. GRIFFITH said that it was important to make sure whether the vaginal secretions were formed in the vagina or were merely retained in that canal. The vagina was anatomically skin, and actually became dry skin in procidentia and cystocele, and then no secretion could be found but what was evidently uterine. Glycerin would then act on the vagina as on any surface skin, irritating it and, by absorbing the moisture in the surface-cells, rendering it more dry than before. In Dr. Klein's opinion, the acidity of vaginal mucus, like that of the sweat, was due to decomposition.

After some observations by DR. BRAXTON HICKS, DR. HERMAN, in reply, stated that he thought the loss of weight by the napkins or pads due to evaporation was but slight; on the other hand, the perspiration from the skin with which the napkin was in contact, might cause a slight increase in weight. Dr. Herman had used the words "secretion poured into the vagina," which did not imply any opinion as to their source. Whether the secretion was of uterine or vaginal origin, whether it was produced by glandular activity or simple osmosis, he could not tell. He would be obliged if Dr. Griffith could suggest any method, harmless to the patient, by which the excretions of the uterus could be separated from those of the vagina. Dr. Herman believed that the vagina did secrete mucus. In cases of atresia of the vagina at more than one place, collections of mucus fluid were found between the occlusions. In cases of atresia of the os externum, the vagina was as moist as in most other patients. That under pathological conditions the vagina might pour out fluid in abundance needed no demonstration.

A NEW ANTHELMINTIC.

DR. PARISI accidentally discovered that the cocoanut possesses anthelmintic properties. Two hours after eating the endocarpium of the nut and drinking the juice he felt slight nausea, gastric disturbances, and slight diarrhœa. On the following morning he passed a large tænia, with the head attached. Thinking that perhaps the cocoanut had led to this result, he made inquiries as to whether similar success had ever been attributed to the use of the cocoanut, but without obtaining any satisfactory replies. He then repeated the experiment in his patients in Athens; in six cases he noted success in producing the evacuation of the tæniæ. Should Dr. Parisi's results be confirmed, the cocoanut is to be preferred as an anthelmintic from the fact that it needs no previous preparation, and on account of its freedom from disagreeable taste, etc.—*Schmidt's Jahrbücher*, December 15, 1888.

MORBID CHANGES IN POISONING BY COCAINE.

While the physiological and clinical literature of cocaine has attained already truly enormous dimensions, the chapter on morbid lesions arising under the influence of the alkaloid remains yet almost untouched. Hence the practitioner cannot help feeling very grateful to DR. VASILY M. ZANTCHEVSKY, of

St. Petersburg, who has just published an ably written experimental work ("St. Petersburg Inaugural Dissertation," 1888, p. 39; analyzed by Dr. V. Idelson, *London Medical Recorder*, December 20, 1888) aiming to fill up an important gap in our knowledge of a drug which undoubtedly represents the most brilliant acquisition of modern therapeutics. Dr. Zantchevsky's experiments, conducted under the guidance of Professor N. P. Ivanovsky, were made on healthy adult dogs (animals which are fairly sensitive in regard to cocaine, as Professor Anrep has first pointed out) into which (usually Merck's, sometimes Boehringer's) hydrochlorate of cocaine was injected hypodermically. In one group the effects of lethal doses, and in another chronic poisoning, were studied.

I. *Acute poisoning* was induced in five animals whose body's weight varied from five thousand to nine thousand one hundred grammes (about ten pounds), by injecting from .15 (about 2 grains) to .27 gramme (or .03 per one kilo) of cocaine, the animals dying in from twenty-five to sixty minutes after the injection. The train of toxic symptoms was fairly uniform. For a few minutes after the injection the dog either did not present anything abnormal, or fell into a kind of stupor; then there appeared dilatation of pupils, restlessness, extreme dyspnœa, and acceleration of the pulse, and, in fifteen minutes, attacks of clonic spasms, lasting for half a minute or so, and alternating with paroxysms of typical Cheyne-Stokes's breathing; later on there supervened complete general anæsthesia, dilatation of the palpebral slit, congestion of the conjunctiva, lachrymation, cyanosis, loss of consciousness, incontinence of urine and fæces, stertorous breathing, tremor of the whole body, and progressive failure and retardation of cardiac action.

II. *Chronic poisoning* was brought about in four dogs (weighing from five thousand six hundred to eight thousand two hundred grammes) by injecting cocaine in doses gradually ascending from three or four (about .5 per one kilo) to ten or sixteen centigrammes a day, the whole amount taken during the experiment varying from 1.08 to 7.8 grammes, and death ensuing in from forty-three to one hundred and seven days. The initial small doses gave rise to acceleration of breathing and pulse, fleeting (fifteen minutes') general restlessness, also consecutive weakness of the animal's hind limbs, mydriasis, and rise of the rectal temperature (.3° to .5° C.), the symptoms disappearing in about three hours. Increased doses produced the same but ever more pronounced and prolonged symptoms. The 7-centigramme doses induced sometimes *manège* movements of two or three minutes' duration, with extreme restlessness, followed in four hours or so by as extreme weakness and lassitude. The 8-centigramme doses gave rise to stupor, with high dyspnœa, acceleration of the pulse, and mydriasis, of two or three hours' duration. The 1-decigramme doses caused a complete narcosis, rise of the rectal temperature (1° C), decrease of general sensibility, and other symptoms of acute poisoning. In two of the animals there occurred several attacks of clonic spasms. Both of them died suddenly after a convulsive paroxysm, with consecutive profound prostration. The other two sank gradually from progressive extreme cachexia (which, however, was more or less pronounced also in the former two dogs).

III. *Morbid lesions*, either in acute or in chronic poisoning by cocaine, did not represent anything characteristic or pathognomonic. A. *Microscopical Examination*.—In acute poisoning there were invariably found all those alterations which occur in cases of fatal asphyxia,—such as dark fluid blood, engorgement of the thoracic veins, dilatation of the right auricle and ventricle of the heart, venous congestion and œdema of the lungs, extravasations under the pleuræ, pericardium, endocardium, and gastric mucous membrane, cyanotic liver, contracted spleen, moderate hyperæmia of the brain and spinal cord, and a more intense one of their meninges. The same changes were present also in those two cases of chronic poisoning which had terminated suddenly, while in the eminently cachectic two cases there were detected extreme anæmia and dryness of all organs except the brain, medulla oblongata, spinal cord, and cerebro-spinal meninges, which were intensely congested. B. *Microscopical Examination.*—*Blood* did not present any structural changes. *Lungs:* In acute cases there were present dilatation of the alveolar vessels, with extravasations and occasional collapse of the alveoli; opaque swelling of the alveolar epithelium; hyperæmia and extravasations in bronchioles. *Liver:* In acute poisoning there were found opaque swelling and granularity of hepatic cells, hydropic and granular degeneration of the epithelium of gall-ducts; serous infiltration of the interlobular connective tissue; engorgement of the interlobular and central veins, with occasional small-sized extravasations in their neighborhood; and a distinct

increase of glycogen in hepatic cells. [The latter statement is in accord with Professor Tarkhan-Mouravoff's observations, according to which large doses of cocaine rapidly give rise in dogs to glycosuria of about five hours' duration; *vide* the *Jürnal dla Normal. i. Patolog. Histolog*, etc., vol. vi] In chronic intoxication, Dr. Zantchevsky found atrophy and albuminoid degeneration of hepatic cells, atrophy of the interstitial tissue, and atrophic attenuation of vascular walls. *Heart* presented considerable lesions in every one of the cases. In acute poisoning there were found initial signs of albuminoid degeneration of muscular fibres; minute extravasations in the subpericardial and, in a lesser degree, in the subendocardial and interstitial connective tissue; tumefaction of the endothelium of capillaries; opaque swelling and (non-fatty) granularity of many cardiac ganglia, with indistinctness of their nuclei. In cachectic chronic cases the degenerative (albuminoid and fatty) changes were still more pronounced, the muscular fibres having lost their striæ and being intensely granular, while the vessels were empty and their walls atrophied; the cardiac ganglia presented extensive fatty degeneration and atrophy of their cells with vacuolization of the protoplasm, their nuclei being extremely indistinct. The *medulla oblongata*, especially the *spinal cord*, proved to have undergone still more profound alterations. In acute cases there was invariably met albuminoid degeneration of ganglionic cells of the medulla oblongata, anterior and posterior horns, Clarke's columns and Roland's gelatinous substance, the spinal changes being especially pronounced in the regions of the cervical and lumbar enlargements. There were found, further, dilatation of perivascular spaces, small extravasations in the gray matter, and occasionally mucoid degeneration of the epithelium of the central canal. In chronic poisoning, side by side with the same (but more intense and more extensive) degenerative lesions, there were detected hyaline degeneration of nerve-cells in the spinal gray matter, engorgement of veins and capillaries (especially in the gray substance), and such changes of vascular walls as proliferation of their nuclei and hyaline degeneration, with consecutive varicosity of the diseased vessels. All those lesions in the medulla and spinal cord had a circumscribed character,—that is, were scattered in a patch-like manner over various districts of the organs. Dr. Zantchevsky is inclined to think that "the degenerative changes arising in the nerve-centres under the influence of cocaine may be partly explained (apart from a still obscure specific action of the alkaloid on the nerve-elements) by a disturbance in the circulation of the central nervous system, which is caused by the drug. In acute poisoning cocaine brings about, in the first instance, a rise of the blood-tension, with a consecutive diminution in the supply of arterial blood; a subsequent fall of the blood-tension and a synchronic disturbance of breathing lead to a profound alteration of the blood in regard to its gaseous ingredients; hence the altered blood becomes an additional irritant agent; and hence there arise disturbances in the nutrition, and degenerative changes of the nerve-cells." It would be superfluous, of course, to dwell on an extreme sensibility of the nerve-tissue towards any slightest deviation in the circulation or the composition of blood. In conclusion, Dr. Zantchevsky draws attention to a close similarity between the morbid lesions in the nerve-centres as found by him in cases of the cocaine-poisoning, and those detected by Dr. Cziz in cases of acute and chronic poisoning by morphia and atropia (*Meditz. Pribavl. k' Morsk. Sborn.*, May and June, 1883), the difference being only a quantitative one; the former are somewhat milder comparatively with the latter. Perhaps there exists a still greater similarity between the alterations caused by cocaine and those found in the nerve-centres and their blood-vessels in starvation (as described by Drs. V. Mankovsky [the *London Medical Record*, February, 1884, p. 73] and V. Rosenbach, in his "St. Petersburg Inaugural Dissertation," 1883). Judging from that analogy, Dr. Zantchevsky arrives at the general conclusion that "the cause of those degenerative changes as occur in chronic poisoning by cocaine should be sought in disturbed nutrition of cellular elements, which, in its turn, depends upon lesions of vascular walls, caused by a direct action of the alkaloid."

FLUSHING THE PERITONEUM.

The practice of washing out the peritoneal cavity in abdominal sections where much blood, serum, or other fluid or semifluid matter has been effused, is a most important innovation in modern surgery. Certain well-known and distinguished British specialists are zealous advocates of this system of flushing the peritoneum, which they have practised with great success. A full stream of

water at blood-heat, poured into the peritoneal cavity, detaches clots, etc., which sponges may fail to remove, counteracts the effects of chill caused by the opening up of the great serous cavity, and likewise acts as a hæmostatic. The advocates of flushing insist on the necessity of subsequent drainage.

The good results of flushing the peritoneum, according to the testimony of experts, have tempted others to try the practice, not always with similar success. Indeed, a distinguished French surgeon recently read before the Paris Obstetrical Society an important paper on the danger of flushing the peritoneum during abdominal section. In one case the patient was placed in great peril. In a second case death occurred. A patient, whose age is not stated in the report published in the *Journal de Médecine de Paris*, suffered from suppurating oöphoritis on the left side, and double salpingitis. At the operation the appendages could not be removed until intimate adhesions had been broken down. The peritoneum was flushed with "hot distilled water," and during the process profound syncope, with suspension of respiration, took place. Artificial respiration was carried on at first in vain, and a tracheotomy wound was made in the integuments of the neck, when immediately spontaneous inspirations occurred, and the patient thenceforward did well. In the fatal case the patient was a single woman, aged 28. She took chloroform badly, the excited stage was long, and she readily came to, though plenty of chloroform, out of "a new bottle," was administered on a piece of lint. A large cyst had to be shelled out of the broad ligament. As much blood was effused, M. Polaillon determined to flush the peritoneum. He employed distilled water, previously boiled, and containing 1 part of carbolic acid to 100. The water was poured into the pelvic cavity through a wide glass canula, at a temperature of about 99° F. After the flushing had been carried on for about three minutes, respiration became rapid, then grew feeble and ceased; the face became blue. The heart continued to beat regularly. The alarming symptoms began at a quarter-past ten o'clock. Artificial respiration was continued till eleven. Then a few feeble inspirations began, and continued for a quarter of an hour; the pupils were then half contracted. The heart beat regularly and quickly. The patient continued unconscious. M. Polaillon immediately closed the abdominal wound, fixing the broad pseudo-pedicle outside. Notwithstanding inhalations of pure oxygen, friction, injections of ether, electricity applied to the level of the attachments of the diaphragm, and other stimulant measures, spontaneous respiration could not be permanently maintained. Once more artificial respiration was tried. Phlebotomy only resulted in the escape of a few drops of very dark blood from the left arm. Gradually the heart's action became more and more feeble, the face grew pale, flatus escaped from the anus, and the pupils dilated. A few minutes before noon the patient was evidently dead. The patient had been thirty-five minutes under chloroform. About one ounce and a half of the anæsthetic was used up, but not nearly that amount could have been actually inhaled.

M. Polaillon observed that this death was not only caused by chloroform; the flushing of the peritoneum must also bear part of the blame. He noted severe syncope in two cases at the moment when he injected very hot water into the abdominal cavity in order to wash coils of intestine and the peritoneum in general. Respiration was maintained in both these cases. In the instance above described at length the coincidence of the flushing with the cessation of respiration was equally marked. He specified that he at first poured about half a gallon of hot carbolized water into the pelvis, and, as the water came out strongly blood-stained to the last, he poured in more water, accidentally hotter than the first supply. The pelvis being full, the water reached the upper part of the abdominal cavity. It was at this moment that respiration ceased. M. Polaillon believed that the stimulus of the hot water touching the diaphragm or the solar plexus caused, by reflex action, the arrest of respiration and syncope. He likened the accident to the effects of a contusion in the epigastric region. This arrest of respiration was liable, as in this case, to remain permanent in a subject under chloroform, which already weakened the respiratory influence of the medulla. He advocated the placing of the lower part of the patient in a lower position than the upper, so as to prevent the water used in flushing from running towards the diaphragm. M. Polaillon also maintained that the water should never be over 99°. Some authorities may think that the presence of carbolic acid increases the danger of flushing. M. Polaillon's case decidedly deserves the serious consideration of all operators, now that the practice of flushing is becoming more and more general.—*British Medical Journal*, December 22, 1888.

THE OPERATIVE TREATMENT OF HYDROCELE.

The last number of Professor Bruns's *Beiträge zur Klinische Chirurgie* contains a paper on the "Operative Treatment of Hydrocele and its Ultimate Results," in which DR. HERTZBERG, of Tübingen, endeavors to prove the superiority of incision over injection by a record and analysis of forty-six cases, in which Volkmann's radical operation was performed. The youngest patient was 12 years of age, and the oldest 56 years; in six cases the hydrocele affected both sides of the scrotum. The operation in each case was performed with full attention to antiseptic details. The vaginal cavity was washed out with a weak solution of corrosive sublimate; a drain-tube of medium size was passed through the cavity, and brought out through a counter-opening at the lower part of the scrotum, and the seat of operation and the surrounding parts were finally covered by a dry dressing of wood-wool. Professor Bruns practises partial excision of thickened indurated or superfluous tunica vaginalis, but holds that total excision of this membrane is not required, save in very exceptional cases. Care was taken to relieve the vaginal cavity of all products that were supposed to be associated with the disease, and in cases where such morbid conditions existed, deposits and growths were removed from the tunica vaginalis, and hydatid and other cystic growths from the testis or epididymis. In thirty-three cases recovery took place without any signs of local or general reaction. In eight cases there was severe general reaction with subjective disorder and prolonged fever. Such conditions, which, however, are now but very rarely observed, are the result of interference with primary healing by effusion of blood into the vaginal cavity, of inflammatory œdema of the scrotum, of swelling of the testis, or of suppuration in the perineum or the anterior abdominal wall. In a large majority of the cases collected by Hertzberg the drain-tube and sutures were removed on the fifth or sixth day, and the patient was able to leave his bed at the end of the first, or the beginning of the second, week. The average duration of the stay in hospital was a little over sixteen days. In this respect Volkmann's operation seems at first sight to compare unfavorably with injection of iodine. The usual duration of hospital treatment by the latter method is from eight to ten days, but, it is pointed out, injection is very often followed by tenderness and swelling of the scrotum and effusion into the vaginal cavity, which may last for weeks, and even for months. All the patients treated by incision and drainage at Tübingen were discharged as cured, and the primary results were all very favorable. By subsequent inquiry and observation Hertzberg has made out that the benefits derived from the treatment have been maintained, and that forty-five out of forty-seven hydroceles treated by cutting operation have been permanently cured. By comparing tables, derived from different sources, of carefully-recorded and long-observed cases of hydrocele treated by incision and injection, he finds that the relapses after the former treatment constitute from three to four per cent. of the total number of cases, while those after treatment by puncture and injection of iodine amount to eight per cent. In conclusion, Hertzberg expresses it as his opinion that incision is the most rational method of treating hydrocele, especially with regard to the certainty of obtaining a permanent cure, and that in future it will be more frequently practised, as the appreciation of the value of antiseptic surgery becomes more widely spread.—*London Medical Recorder*, December 20, 1888.

THE USE OF CHLORIDE OF METHYL SPRAY.

M. BARDET proposed before spraying a surface with chloride of methyl, in order to produce local anæsthesia, to paint it with glycerin. The revulsive action is less acute and less severe, while the glycerin forms a surface on which the drops of the refrigerant mixture collect, and which may be readily removed after the desired effect has been produced. The use of glycerin is said to entirely do away with the danger of sloughing.—*Gazette Hebdomadaire de Médecine et de Chirurgie*, November 23, 1888.

THE THERAPEUTIC APPLICATION OF STROPHANTHINE.

In *La Tribune Médicale*, November 18, 1888, MM. GERMAIN SÉE and GLEY report the results obtained by the use of strophanthine. They have used it especially in mitral lesions, and particularly in contraction of the mitral orifice, and the results obtained by its use are favorable. The authors find the explanation of this fact in the increased cardiac power produced by this drug as determined by sphygmographic tracings. Within an hour the pulse visibly strengthened, the line of ascension in the tracings, which had

been almost horizontal, becoming rapidly nearly vertical; the line of descent suddenly falls and the dicrotic wave disappeared, while the irregularities and inequalities of the pulse almost always are overcome. The authors claim that even where the heart had lost its power, where compensation no longer existed, and where there was marked pulmonary stasis and œdema, they had used it with success. In none of these cases, however, was there any relief of the dyspnœa, no increase of diuresis, and consequently no diminution of the œdema. In cases of dilatation of the heart, and hypertrophy depending upon generalized arterio-sclerosis, the same results follow the administration of strophanthine,—that is, strengthening of the pulse and augmentation of the general strength. In painful affections of the heart, such as angina pectoris, strophanthine, so far from being useful, even appears to aggravate the condition. No disturbing effects have been noticed either on the stomach or on the brain, with the exception of transient vertigo noted in a certain number of cases.

THE ACTION OF INHALATIONS OF CHLORIDE OF ETHYLENE ON THE EYE.

We have already alluded to the statement made by M. Raphael Dubois as to the fact that inhalations of chloride of ethylene employed as an anæsthetic lead to opacity of the cornea, and perhaps even to glaucoma. M. PANAS has likewise experimented with the chloride of ethylene, and he reports his results as follows (*La France Médicale*, December 11, 1888): Anæsthesia may be produced in the dog after an inhalation of about 80 minims of chloride of ethylene in a time varying from twenty to thirty minutes. On prolonging the inhalation from three-quarters of an hour to an hour, the following phenomena were noticed in the eyes. The injection of the conjunctiva did not occur until four hours after the inhalation. The pupil was dilated, and remained in the dilated condition for several days. The cornea became opaque after the first inhalation, and this did not disappear until a week or more subsequently, gradually disappearing from the outer edge to the centre. On four dogs, after the cornea had cleared up, subsequent inhalations did not appear capable of producing any new corneal trouble, and it seemed as though the animal had become habituated to the drug. On the other hand, in another animal a new inhalation before the opacity had been reduced lead to an increase of the trouble. Contrary to the conclusion of Dubois, Panas states that, so far from the eye becoming glaucomatous, he has often noticed a reduction of the ocular pressure. His histological studies showed that there was marked serous infiltration of the cornea, while the anterior epithelium, as well as Bowman's membrane, remained intact. On the other hand, the endothelium of Decement's membrane was nearly always found detached or destroyed; the cells were the seat of karyokinesis. The other parts of the eye—the iris, choroid, retina—did not show any noticeable alterations. The conclusions which are drawn are: first, that the corneal trouble produced by the inhalations of the chloride of ethylene is dependent upon the serous infiltration of the corneal parenchyma; second, that the mechanism of the production of œdema of the cornea depended upon the destruction by this agent of corneal endothelium, which alone protects the cornea from invasion by the aqueous humor.

THE TREATMENT OF OBESITY.

In the *British Medical Journal* for November 10, 1888, DR. W. T. SMITH reports a method of reduction of obesity which proved so successful in his own case that he has tested it in forty-two other cases, in most of which success was obtained. The plan which he follows is to confine the diet to rump-steak, codfish, and hot water for fourteen days, with the absolute exclusion of everything else. Taking meat in large quantities may lead to dyspepsia, but this can be easily overcome by reducing the meat to an essence. This may be done as follows: Take four pounds of beef, free from skin and fat; cut it to pieces about an inch square; place the meat in a close-fitting, air-tight jar; stand the jar in a pan of boiling water, and let it simmer for six hours. Pass the juice of the meat thus obtained through a sieve; then measure four ounces of the fibrin of the meat; pulverize it in a mortar, and stir it up with the essence; divide this into four doses, and you will obtain the nitrogenous elements required of the quantity of meat to be taken at one meal. There is also a similar way of obtaining meat essence by using a pot called "Boule Américaine."

In treating his cases, in several instances he has been obliged to modify the amount of hot water and lessen occasionally the quantity of meat; but as regards his own personal experience, he found that three pounds of rump-steak and one pound of codfish were hardly sufficient to satisfy his appetite. The meat

diet and hot water alone must be regularly adhered to for fourteen days, and the amount of hot water, taken at any time during the day, commencing at seven in the morning and finishing at half-past ten at night, varies from six and one-third pints, more or less, according to the powers of the patient.

The second epoch of twenty-one days the diet may be considerably varied, as he reduces the hot water to four pints in the twenty-four hours, and he allows other kinds of meat, such as mutton-chops, free from fat, and chicken; and, as regards fish, grilled turbot, whiting, or soles; a little green vegetable, and some slices of plain unsweetened rusk.

The third epoch, thirty-one days, the hot water is reduced to about a quart a day, and he allows tea, stale bottom crust of household loaf, captain's biscuits, grilled fish, fowl, game, turkey, any joint, hock or claret, with seltzer-water, in place of whiskey. As hot water is very unpalatable, a slice of lemon may be added to each tumbler.

No case of obesity should be treated by this method when the patient is suffering from any organic disease, unless it be some trifling malady. The loss of weight in nearly all cases will vary somewhat, but Dr. Smith states that his patients bear the treatment exceedingly well, and express themselves as feeling far better in health and able to take exercise with comfort. The first period of fourteen days is really the only hardship, and he has found very little difficulty in persuading patients to stick to the diet. As some alkali is essential, he prescribed five grains of the bicarbonate of potassium, to be taken night and morning. Dr. Smith offers to send his diet-cards to any medical practitioner who will write to him, but asking that the result of any case put under treatment be reported to him. The following table shows the results of his method of treatment:

Before treatment.							After treatment.				
No.	Date.	Sex.	Age.	Weight.		Girth.	No.	Date.	Weight.		Girth.
				St.	lbs.	Inches.			St.	lbs.	Inches.
1	Jan. 3	M.	45	14	10	43	1	March 6	13	2	39½
2	" 10	M.	40	13	12	41	2	" 16	11	10	37
3	" 18	M.	48	15	4	46	3	" 28	13	1	41½
4	" 21	M.	39	14	2	42½	4	April 1	12	1	39¾*
5	" 29	M.	53	16	9	47	5	" 10	14	2	41½
6	Feb. 2	M.	45	12	10	39	6	" 18	11	1	33½
7	" 3	M.	39	14	2½	41	7	" 20	12	3	37¼
8	" 7	M.	42	15	4	44	8	" 18	13	6	39
9	" 10	M.	54	16	2	48	9	" 22	14	5	42½*
10	" 11	F.	33	13	1	37	10	" 24	11	4	32½
11	" 19	M.	39	14	6½	41½	11	" 30	12	8	39
12	" 23	M.	45	13	10	39	12	May 1	12	5	34
13	" 26	M.	52	14	10	42	13	" 6	13	2	39½
14	" 28	M.	49	13	12	39½	14	" 10	11	10	37½
15	" 29	F.	43	15	2	45	15	†			†
16	March 2	M.	51	14	10	41½	16	" 18	12	6	39½
17	" 4	M.	48	13	6	36	17	" 19	11	13	37¾
18	" 8	F.	37	13	4	35	18	" 20	12	10	34
19	" 8	M.	59	14	10½	41	19	" 22	13	4	39
20	" 12	M.	42	12	10	34	20	" 24	11	6	33
21	" 14	M.	45	14	5	41	21	" 25	12	7	38¾*
22	" 18	M.	59	14	10	42	22	" 29	13	6	39
23	" 18	M.	41	13	10	39½	23	" 30	12	2	35½
24	" 23	M.	52	13	12	41½	24	June 3	12	6	40
25	" 29	M.	32	13	8	39	25	" 10	11	6	36½
26	April 1	M.	49	14	10	43	26	" 12	12	11½	38
27	" 8	M.	37	13	2	38½	27	" 29	12	0	34
28	" 10	M.	51	15	10	44½	28	" 28	13	8	41¼
29	" 18	M.	31	12	9	38½	29	July 1	11	2	34
30	" 20	M.	49	13	13	41	30	" 8	12	3	38½*
31	" 29	M.	28	14	10	44½	31	" 7	12	1	37½
32	May 4	M.	39	13	12	42	32	" 15	12	4	38
33	" 10	M.	42	14	1	41	33	" 20	12	7	37
34	" 15	M.	49	13	10	39	34	" 20	12	2	38¾*
35	" 20	M.	52	14	8	45	35	Aug. 4	12	6	39½
36	" 29	M.	49	13	13	41	36	" 14	12	8	38
37	June 1	M.	42	15	12	43	37	" 27	13	6	39½
38	" 5	M.	51	14	10	42	38	Sept. 2	12	10	38¾
39	" 20	M.	42	16	1	48	39	" 8	14	5	43
40	" 24	M.	39	13	8	39½	40	" 12	12	1	36
41	" 27	M.	45	14	10	42	41	" 20	13	1	39½
42	July 1	M.	50	15	4	45	42	" 28	13	6	40½

* Treated by letter.

† Failure; would not conform to rules.

CURE OF SPASMODIC COUGH BY SPRAYING WITH CHLORIDE OF METHYL.

Recently, at the meeting of the Société de Médecine Pratique, Dr. Huchard demonstrated the favorable action of spraying with chloride of methyl in spinal irritation, exophthalmic goitre, chorea, and various other nervous troubles. In the *Revue Générale de Clinique et de Thérapeutique* for January 2, 1889, Dr. Garel reports the case of a young girl, 13½ years of age, suffering from slight polydipsia and polyuria, who had had a choreic form of cough for almost two months. This cough was spasmodic, very loud, and precisely resembled the cough of whooping-cough. The employment of antispasmodics and of cocaine in a ten per cent. solution, applied locally to the surface of the larynx, had produced no relief. Then spraying of chloride of methyl was applied to the neck and upper part of the back, at the same time subjecting the parts sprayed to energetic friction, to protect the tissues from too excessive reaction. On that evening there was some improvement, and six days after a cure of the laryngeal cough was produced.

ALLYL TRIBROMIDE.

"Allyl tribromide" ($C_3H_5Br_3$) has been recently recommended strongly as a remedy for whooping-cough, and also as being useful in the treatment of hysteria and asthma (*Pharm. Post*, December 2, p. 780). In cases of whooping-cough it is administered internally in capsules containing about 5 drops, or injected subcutaneously. "Allyl tribromide" is described as being a colorless or faintly yellowish liquid at the ordinary temperature, but solidifying when cooled below 10° C. to a mass resembling a stearopten, and having a specific gravity of 2.430. In the presence of the use of the name "allyl tribromide" for this compound it may be convenient to recapitulate briefly a portion of its history. In 1857, Wurtz described, under the name "tribromide of allyl," a compound he had obtained by treating allyl iodide with bromine (*Ann. Chim. Phys.* (3), li. 91). It was a colorless neutral liquid, having a specific gravity at 23° C. of 2.436, boiled at 217° to 218°, and at a temperature below 10° C. became solid. These properties differed from those attributed by Berthelot and Luca to the isomeric "tribromhydrin," one of the series of compounds which they had prepared in the previous year by the action successively of phosphorus tribromide and pentabromide upon glycerin (*Ann. Chim. Phys.* (3), xlviii. 304), in which products one or more of the hydroxyls of the triatomic alcohol were replaced by bromide. Tribromhydrin was described by them as a heavy liquid, volatile at about 180° C., slowly decomposed by water, and forming slightly on contact with air. Wurtz, having obtained his "tribromide" by acting on an allyl compound, assumed that it differed from the glycerin derivative, and that in this instance the radical allyl exercised a trivalent affinity. But, in the light of subsequent investigations, this appeared doubtful, and in 1870 Henry announced that Berthelot and Luca had been led into error by the impurity of their material, in their description of tribromhydrin, and that pure tribromhydrin prepared from glycerin showed no difference in physical properties from Wurtz's tribromide of allyl obtained by treating allyl iodide (*Annalen*, civ. 368). This statement was challenged by Berthelot, but was reaffirmed by Henry after repeating his experiments; and allyl tribromide and tribromhydrin, or tribrompropenyl, are given as synonymous terms in the more recent chemical works. — *Pharmaceutical Journal and Transactions*, December 29, 1888.

HAMAMELIS AND HYDRASTIS IN PULMONARY HEMORRHAGE.

One of the weakest points in our therapeutic measures is the treatment of pulmonary hemorrhage. With most cases of hemorrhage from the lungs recovery is rather a matter of good fortune than one for which we deserve any credit, since it is but seldom that the hemorrhage is so severe as to directly and immediately endanger life. It is unfortunately true that while without controlling the hemorrhage most of the therapeutic measures now employed simply tend to disturb intestinal and gastric digestion. In the *Therapeutische Monatshefte* for November, 1888, Dr. Koeniger writes that for the last three years he has been employing almost exclusively the fluid extracts of *Hamamelis Virginica* and *Hydrastis Canadensis* in similar cases. While it is not claimed that these drugs arrest all pulmonary hemorrhages, and while severe hemorrhage is not invariably influenced by them, yet in by far the majority of cases their action is undoubtedly favorable, even after other means have failed. In the cases of periodic hemorrhage from the lungs, the

administration of these drugs before the expected hemorrhage has served to prevent its appearance. Likewise he claims that the drugs themselves produce favorable action on the stomach, and may be regarded as forming a good tonic. When the cough is severe he administers 2 grains of Dover's powder, and this, together with 20 to 30 drops of the fluid extract, is usually sufficient to produce arrest of the hemorrhage.

CHOLECYSTOTOMY.

At the recent meeting of the Royal Academy of Medicine in Ireland, MR. KENDAL FRANKS read a paper on a case on which he had operated for the removal of gall-stones. (*British Medical Journal*, January 5, 1889.) The patient, a lady, aged 52, had suffered from biliary colic, accompanied by severe feverish attacks and jaundice, from December 26, 1886. After her admission into hospital the attacks of pain and fever were almost of daily occurrence. The diagnosis was rendered difficult owing to a tumor which occupied the right side, from the costal arch to the crest of the ilium. A smaller globular tumor was felt between this and the umbilicus during the attacks of pain. The patient was in an emaciated and exhausted condition when the operation was performed. The larger tumor on the right side proved to be an abnormally shaped right lobe of the liver, the long axis of which was quite vertical in direction. The gall-bladder contained four calculi, which were removed through an incision in its anterior wall. No stone or tumor could be found obstructing the cystic duct or the ductus communis choledocus. It was evident that the obstruction was due to a stricture of the common bile-duct. The opening in the gall-bladder was sutured to the abdominal wound. The patient made a rapid recovery, and when seen nine months later she had gained in weight, and looked healthy and well. She suffered no pain or distress, but the bile continued to flow from the fistula in the side. The absence of bile from the intestines seemed to interfere in no way with her health.

MR. BARTON had had a similar case a year before that of Mr. Franks. The patient was an elderly woman, who had suffered from symptoms of gall-stone for many years. She was a good deal emaciated, and her nutrition had suffered from long-continued disease. She was heavily jaundiced, and the abdomen, on palpation, showed a well marked tumor in the region of the gall-bladder. The operation was perpendicular to the costal cartilages, about four inches in length, and the peritoneum was readily reached and opened. He passed his finger into the gall-bladder, and felt through the walls a number of hard gall-stones, some being impacted in the common duct. The anterior wall of the bladder was stitched to the edge of the incision. The lower part close to the gall-bladder having been opened, a large gush of greenish-yellow bile followed, and he removed with his finger three large stones. But the real difficulty was to reach the stone or stones impacted in the duct, which constituted the cause of the obstruction. Squeezing or pressing was out of the question, and the only course was to reach the stone or stones with the finger or the forceps. Once the stone had passed through the duct it was exceedingly difficult to reach or press it in any way so as to make it slip backward. After manipulation he extracted another stone, and concluded that his operation had been successful; but it was not, although the wound was antiseptically dressed, and there was an excellent recovery. There was no peritonitis except in gluing the edges together, and there was no bad result. At the same time there was no relief to the jaundice, and the obstruction remained. The dressings were saturated with bile. She expressed herself greatly relieved, and her appetite increased; but being an elderly woman, she never fully regained strength from the low state of nutrition into which she had fallen; and in the course of three months she died apparently from want of nutrition.

MR. O'CALLAGHAN detailed his experience of four operations in which he assisted Mr. Lawson Tait. The difficulty in removing the stones was surmounted by passing a scoop into the duct and manipulating with the finger outside, so as to work out the stone gradually. He did not stitch the gall-bladder to the opening until after removing the stones. Since then he had had two cases himself, one being successful and the other not; the latter, a woman, however, dying of malignant disease. While the operation was one of the most justifiable, as it was also one of the most brilliant in surgery, the great difficulty was in the diagnosis; and from the results of abdominal surgery he would, where the diagnosis was in doubt, feel justified in making an exploratory incision. Of course, the drainage-tube was not removed until the bile was flowing freely and the temperature became normal.

MR. CROLY thought that the course of closing the gall-bladder and peritoneal surfaces left a space too limited to take out the gall-stones, and there was also the disadvantage of shutting out the surgeon from following the duct, and doing satisfactorily the most intricate part of the operation.

MR. THOMSON did not think there was much difficulty in cutting down on a gall-bladder and removing stones, if stones were there; but the great difficulty was to determine whether or not the surgeon had to deal with a distended gall-bladder. Mr. Lawson Tait, who had the largest experience of any single person in abdominal surgery, had laid down the rule that when he was in doubt as to what was inside, he cut down upon it, and put in his finger and felt it. He had had a case in point in which all the symptoms indicated a distended gall-bladder; but, on cutting down, it was found to be a large perinephric abscess, which extended forward, pressed on the under surface of the liver, on the gall-bladder, and on the duct, and had, from mere pressure, brought on attacks of jaundice, from which the lady suffered. Of course there were certain cases easy of diagnosis; he had himself removed over two thousand gall-stones in a case post mortem. The tumor had been diagnosticated as malignant, and the lady, whom he only saw after death, suffered considerable pain. When she died, however, there was no difficulty of diagnosis. There was an enormous number of little stones, which could be felt, and even heard, when crushed between the finger and the thumb. The escape of bile through the abdominal wall had been noted in many cases, especially where the gall-bladder had been extirpated altogether, suggesting the inquiry as to the precise use of that organ.

MR. FRANKS, in reply, said that Mr. Lawson Tait showed that excision of the gall-bladder was as sensible and justifiable an operation to prevent the formation of gall-stone as to excise the urinary bladder to prevent the formation of stone. There were two distinct classes of cases,—one of large numbers, and the other, more serious, of solitary gall-stones. The large gall-stones became impacted in the duct, and, if left alone long enough, would lead to suppuration. As regards Mr. Croly's justifiable criticism, in his case, before opening or suturing the gall-bladder he felt the surface of the liver carefully, and satisfied himself there was no obstruction in the nature of stone or tumor upon either of the ducts, and there was no necessity to explore the gall-ducts from inside. The real disease was not gall-stone, or stricture of the cystic duct, but stricture of the common bile-duct. As regards diagnosis, a gall-bladder distended with bile, not gall-stone, made the diagnosis a question of extreme difficulty. He agreed that in cases of doubt an exploratory incision was justifiable.

ESCHSCHOLTZIA CALIFORNICA.

At the meeting of the Société de Thérapeutique, held November 14, 1888, M. BARDET related the results of the studies which, in connection with M. ADRIAN, he had made as to the chemical composition of *Eschscholtzia Californica*, a plant belonging to the family of Papaveraceæ, considered in America as a succedaneum to opium, and as an admirable sedative for children (*Gazette Hebdomadaire de Médecine et de Chirurgie*, November 23, 1888). Messrs. Bardet and Adrian have extracted three products from this plant,—glucoside, an organic base, perhaps originating from the action of the reagents on the glucoside, and a small quantity of morphine. Two pounds of the dried plant contain from five to six grains of morphine. The presence of morphine, which has been perfectly demonstrated by various tests, is very interesting, for it has as yet not usually been found in other classes than the papaver.

In reply to a question by Wurtz as to whether morphine had been obtained in crystalline form, and referring to the fact that the crystals of the alkaloid are perfectly characteristic, M. Bardet answered that as yet the morphine had only been obtained in an amorphous form, but that the various tests determined its identity beyond a question.

NON-STRANGULATED HERNIA.

At the recent meeting of the Harveian Society, MR. MITCHELL BANKS read a paper with the above title (*Lancet*, January 5, 1889), in which he divided non-strangulated hernia into two groups,—(1) moderate-sized herniæ, and (2) very large and enormous herniæ. This has been done because they are by no means on the same footing either as regards danger to life from the operation or liability to recurrence of the rupture. In the statistics which he gave the terms were used in the following manner: By "quite sound" is meant that the rupture has never come down since the operation, that there is nothing in the way

of a swelling to be felt or seen, and that there is no impulse on coughing. By "partial success" is meant that the rupture has slightly returned, or threatens to return if unsupported, but that, with the aid of a truss, the patient is in safety and comfort. In many of these cases no truss at all would keep the bowel up before operation, while after it support could be effectually given. In every instance the patients placed in this category declared that they were in a distinctly better position after the operation than before it. By "complete failure" is meant that the rupture is as large and troublesome as before the operation. Among the fifty-nine moderate-sized non-strangulated herniæ two deaths are recorded. One was distinctly due to the operation. The other was doubtful, as the wound was all but healed, and there was no peritonitis or other lesion relating to the wound found after death. Of the sixteen very large and enormous herniæ four cases proved fatal. Septicæmia killed two patients, and unsuspected abscess, bursting into the peritoneal cavity after the patient was walking about and deemed sound, proved fatal in another, while in one case the operation could not be completed. Of the twenty-two cases of strangulated inguinal hernia one, an old man of seventy-seven, died from septicæmia and bronchitis. Of the nineteen cases of strangulated femoral hernia two died, one never recovered from the collapsed state in which she arrived at the infirmary, and another was moribund when admitted. The statistics of permanence of cure showed that, of the one hundred cases of moderate-sized non-strangulated and strangulated herniæ combined, it has been possible to trace for very considerable periods seventy-seven. Of these, forty-eight remain quite sound, seventeen are partial successes, and twelve are complete failures. Of the sixteen cases of very large and enormous herniæ it has been possible to follow up ten. Of these, five remain practically sound (though all requiring some support to prevent return), three are partial successes, and two are complete failures.

Mr. Bryant's experience of those cases in which the sac was removed was that they succeeded best. After celotomy the operation could not be considered completed until the sac had been removed. Operations in children were to be avoided, except where a truss could not be worn. Opening the sac almost quadrupled the risk. In adult life, operation was unadvisable when a truss could be worn. Large herniæ ought to be left alone; he had occasionally been obliged to operate upon them, but a truss must be worn afterwards.

Mr. Kendal Franks agreed that an operation was necessary in adults who could not wear a truss; also in adults who were athletes. A truss was a great detriment. He always, in operating, sutured the neck of the sac and the internal ring. The operation of twisting the neck of the sac could not be applied in cases where the cord was adherent to the sac. Strict antisepsis was essential to success, and good results were obtained either with silk or silver wire. His bias was in favor of operation. In forty cases he had had four returns.

Mr. Edmund Owen was afraid that Mr. Banks would think that the discussion wandered from the actual subject of his paper,—namely, the permanency of the favorable result after operation, and, for his own part, he also was unable to speak definitely of results. He could only say that he was satisfied with the result of his operations up to the present. He had operated upon a good many children, but he entirely agreed with Mr. Banks that children should not be operated on unless the hernia was absolutely beyond the control of a truss; for it was an undisputed fact that, with a fair chance, children did "grow out of" their inguinal weakness. The cases which he preferred for operation were those of adults whose inguinal herniæ were associated with an atrophied or an undescended testis. In such cases the surgeon should remove the useless gland without compunction, and, having ligatured and pushed up the cord, should completely occlude with sutures the inguinal canal. The objection against the removal of the undeveloped testis was purely sentimental, for the gland was, almost for certain, of no physiological value. He did not believe in the surgeon being able to recognize, during the operation, the "internal abdominal ring" and the "conjoined tendon;" at any rate, though he knew them in the dissecting-room, he ignored them in the hospital. He thought that it mattered little in the permanency of cure whether the surgeon used silver, gut, or silk for closing the canal; but he would ask Mr. Banks how he dealt with the sac of that variety of hernia which descended with the tunica vaginalis. He (Mr. Owen) was satisfied to tie the funicular process high up, flush with the peritoneal wall, so as to leave no depression to invite the subsequent descent of the bowel; he then divided the process below the ligature, and removed an inch or so of the testicular part

of it. He did not believe in the desirability of fashioning and suturing an artificial tunica vaginalis, all that might be left to nature. The point on which he specially desired to join issue with the author of the paper was as regards the subsequent wearing of a truss. If the neck of the sac was obliterated and the inguinal canal thoroughly closed, no bowel should descend, and the truss, therefore, was unnecessary. He always favored the use of a truss after the operation, for he had a strong opinion that the constant pressure of the pad went a long way towards promoting the absorption of the plastic material which was thrown out in the neighborhood of the ligature and sutures, and the definite organization of which had a considerable influence in establishing the permanency of the cure. In conclusion, he ventured to congratulate Mr. Banks upon the straightforward manner in which he had reported his cases and results, favorable and unfavorable, and upon the fairness with which he had laid his conclusions before the meeting.

MR. GAGE also spoke, and said it was necessary to wait some time before publishing results. Mr. Banks's statistics were encouraging.

MR. BARKER could trace cases which had remained well four or five years, and thought this too short a time to give proper information. A speedy return had taken place in four of the forty or fifty cases upon which he had operated. The risks of this operation had been reduced to a vanishing point.

In his reply, MR. BANKS said that removal of the sac was best because of its simplicity. He was himself inclined to operate upon those who could wear a truss; but, in any case, removal of the sac was essential, and repaired the irregularity of the peritoneum. He practised stitching of the rings, but it was of less importance. Umbilical herniæ contained so much adherent omentum and bowel that they were seldom suitable for operation.

THE LOCAL APPLICATION OF HYDRASTIS CANADENSIS.

The peculiar feature of the fluid extract of hydrastis canadensis of producing vascular contraction after its internal administration has led to its internal employment in cases of chronic congestion of various organs. It is strange, however, that as yet it does not seem to have been employed as a local application in spite of the fact that pharmacological experiments with hydrastis have shown that this body is not only a local astringent, but also possesses local anæsthetic properties, a fact which led DR. FELSENBURG (*Wiener Medizinische Blätter*, No. 48, 1888) to test the result of local application of the fluid extract of the hydrastis. He states that his results have encouraged him to further experiments in this connection. His studies were made on a series of cases of chronic pharyngitis, complicated with enlarged tonsils. In all cases he states that the results were good. The local application of the fluid extract to the diseased mucous membrane showed a marked decrease in the contraction of the vessels and reduction of swelling with relief of the subjective symptoms. He states that patients readily accustom themselves to the bitter taste of this remedy, and even prefer the painting of the throat with the fluid extract to other forms of gargles or other local applications. Dr. Felsenburg thinks that perhaps a similar use of this remedy in the case of disease of other mucous membrane might lead to equally satisfactory results.

THE TREATMENT OF SCARLET FEVER BY MERCURIC IODIDE.

At the meeting of the Leeds and West Riding Medico-Chirurgical Society, held January 11, 1889, DR. PURDY (*British Medical Journal*, January 19, 1889) referred to Dr. Illingworth's original paper recommending this treatment and the support given to it by Dr. Clement Dukes, of Rugby. He had now tried it in more than fifty cases, during several epidemics, and was surprised at the results. In spite of the disease in one epidemic being of very severe character, there was only one fatal case, and that was dying when first seen. After giving the drug the temperature fell rapidly, and the patient seemed well in about three days, desquamation being very slight. The average period during which his cases were isolated was only eighteen days. He had seen no cases of infection from convalescents, and there were no lingering sequelæ. In one case a child was ill for five days, the diagnosis being uncertain; then the mother and several children sickened with evident scarlatina, two being very ill, with sloughs in the neck, but all made a good recovery, and were perfectly well before the first child had ceased peeling. The formula used was liq. hyd. perchlor., ℥i; pot. iodid., ℥ss; syrup, ad ℥viii. ½ ounce to be taken every one,

two, or three hours, according to circumstances. Several of his friends had tried this treatment, but with less good results, owing, he believed, to the treatment not having been begun early enough or to insufficient doses.

DR. CAMERON said it was hard to dogmatize on the treatment of scarlet fever. He had lately had eighty cases without a death, where no special medical treatment had been employed, boroglyceride being used to the throats as a routine practice. He thought desquamation generally depended on the extent of the rash. The age of the patient was an important element in prognosis; children under three years suffered most severely.

MR. MAYO had tried mercuric chloride in several cases, and in a few, where the throat was bad, thought the treatment had done good. Local treatment to the throat was used as well. He thought that in a great many cases the temperature fell on the third day, independently of treatment.

DR. CHURTON had seen very severe desquamation where there was hardly any rash. He pointed out the uncertainty in the estimation of the results of medicinal treatment.

MR. HICK had treated in the Leeds Fever Hospital fifty cases with mercuric iodide. Except that there were more cases of nephritis than usual, he could detect no special effect from the use of the drug. He had treated recently three series of eight cases each simultaneously, with iron, mercuric chloride, and a *placebo*, and, on the whole, the latter series did best. He had tried the treatment also in typhus, typhoid, and smallpox, but with no result.

DR. SWANN said scarlet fever was endemic in Batley, and he had seen a large number of cases. He had tried mercuric iodide, but with no special result.

DR. HOWARD thought medicinal treatment, as a rule, was not required. He applied counter irritation by means of iodine to the throat externally, followed by an evaporating lotion, and the insufflation of iodoform and zinc oxide internally.

DR. JACOB referred to the large number of substances asserted, on the basis of long series of "cures," to be specifics for this disease, such as chlorine, pot. chlorate, ozonic ether, etc. Any results, to be conclusive, must extend over a series of years, and include a very large number of cases. As physician to the Leeds Fever Hospital he had seen a large number of cases, and lost faith in any specific treatment, but he thought the local treatment of faucial and nasal conditions very important for the comfort of the patient.

MR. RUMBOLL had, in a recent epidemic, treated thirty-six cases by this method; seven cases had nephritis; two died. He had recently treated a number more by other means, and he could see no special advantage in the treatment proposed. He recommended a spray of ferric chloride to the throat, which he administered by a special spatula, surmounted by a tube through which the spray-nozzle could be passed.

THE TREATMENT OF ASCITES AND GENERAL DROPSY WITH MILK DIET.

That ascites and general dropsy very often yield to the milk-diet treatment is a fact which had been recognized by the native physicians of India from a very remote age. Even in modern times many of the native physicians and quacks treat their dropsy cases in the same way, with at least partial success. They prohibit solid food of every kind, and all articles containing salt. They also prohibit the drinking of water, and make their patients take milk or curd in abundance. But there are a few particulars in connection with this treatment which they do not carefully attend to, and it is for this reason that they do not succeed in many cases.

This plan of treating ascites and general dropsy has received very little attention, the treatment generally recommended being that by watery purgatives, diuretics, and diaphoretics, paracentesis being recommended as a last resource in cases of great distention. In many cases purgatives, especially in hot climates, seem injurious; they appear to irritate the stomach and intestines of the patients and greatly interfere with digestion. Though an occasional purgative, by removing the accumulated fæces from the intestines and by inducing secretions from the intestinal glands, gives great relief to the general system during the course of treatment, it is held by some that a systematic use of purgative medicines, with a view to remove the dropsical effusions, does more harm than good. In many cases thus treated it is stated that dysentery supervenes; in some places it is looked upon as a fatal symptom in connection with ascites or general dropsy. In the *Lancet* for December 29, 1888, MR. K. P. CHOWDHOORY states that he has adopted the method of treatment first recommended by Dr. Richards, of treating ascites and general dropsy by the exclusive use of milk diet, and he has met with almost

uniform success. The very few cases of failure that have occurred in his experience have been those where organic mischief had proceeded too far to be consistent with the maintenance of life. He publishes details of two cases treated by tincture of iron, infusion of quassia, digitalis, squills, and oil of juniper, with milk as exclusive diet. In another case, a drachm of jalap-powder was ordered to start with, and milk constituted the diet, with cinchona, dilute sulphuric acid, and sulphate of iron. In this case also the digitalis, squills, and juniper-powders were given, and both cases were cured. It seems rather strange that, in view of the very extensive list of remedies employed in these cases, the author should attribute to the milk alone the credit of cure. No one of the various remedies employed can scarcely be claimed to be an inert substance. It is true that the author states that the medicines alone would not produce a cure if the milk diet is not given, and even if they are not confined solely to the milk recovery is not attained. The author lays stress on the fact that the milk shall be given in very small quantities, eight ounces being the largest amount allowed at any one time.

THE ACTION OF ICHTHYOL.

Dr. George Meyer has tested the action of ichthyol in articular rheumatism in sixteen different cases. The duration of the disease varied between two and twenty years. It was employed both internally and externally, and its use was continued for about three weeks. Internally it was administered in the form of solution or capsules, or pills, while externally it was painted on the surface in the form of alcoholic ethereal solution. In only two cases did its internal administration produce any distress, in these instances consisting of irritation of the throat, nausea, and eructations. These symptoms occurred in patients which previously had suffered from slight digestive disturbances. Relief of the pains of the chronic rheumatism was never observed, while two of the cases even claimed that their condition was aggravated during the use of the ichthyol.—*Therapeutische Monatshefte*, November, 1888.

A NEW METHOD OF OPHTHALMOSCOPY.

According to the Berlin correspondent of the *British Medical Journal* for January 12, 1889, Dr. Bellarminoff, of Moscow, recently demonstrated to the Berlin Medical Society a new method of ophthalmoscopy. The eye is first made insensible by cocaine; then a little plain glass is pressed against the cornea. Between the glass and the cornea a very fine zone of fluid is instantly formed. Thus, glass, fluid, and cornea being transformed into one refracting medium, the refracting power of the cornea is wholly eliminated. The eye is thus transformed into a highly hypermetropic one. By this method it is very easy to see the fundus of the eye, and four or five persons can examine the eye at the same time. The method is likely to be of great service for the instruction of students, but it is not probable that it will be of much use to practitioners.

THE ACTION OF VARIOUS OILS ON HEALTHY ANIMALS.

According to the Paris correspondent of the *British Medical Journal*, December 15, 1888, M. Daremberg has begun by making a series of experiments on healthy animals, with the view of ascertaining the effect of different oils on tuberculous animals. He found that different oils used as food, and cod-liver oil, may be taken for three months and a half without evil effects by guinea-pigs in daily doses of one cubic centimetre, and by rabbits in doses of three to four cubic centimetres. The oil is easily administered through a glass tube placed in the animal's mouth; the animal usually sucks the tube with avidity. M. Daremberg gave subcutaneous injections of a quarter, half, or one cubic centimetre of oil every day, every second day, or every four days, into the abdomen, the back, or the paws of guinea-pigs and rabbits. The oil and instruments were previously sterilized. In no case were abscesses observed in the animals, but the injections produced the following results: Nearly all the guinea-pigs died after a varying interval of time; they all presented a similar lesion,—namely, fatty perisplenitis. Around the spleen there was a collection of yellowish fat, soluble in ether. The spleen adhered to the kidney and stomach; the stomach adhered to the liver and the parietal peritoneum. Fatty patches were detected on the liver; in some cases the biliary vesicle was completely surrounded by these yellowish masses. In every case there was a yellowish track under the peritoneum, below the costal insertions of the diaphragm on the left, and sometimes on the right side. In no case did the liver adhere to the parietal

peritoneum on the right side of the abdomen. The fatty infiltration almost entirely disappeared when the injections were suspended for a certain time. But the adhesions persisted, as M. Daremberg ascertained by examining several animals which were killed. He found these adhesions: First, in a guinea-pig to which eight and a half cubic centimetres of white cod-liver oil had been given in eighteen days, and which was killed forty-two days after the last injection. Secondly, in a guinea-pig to which seven cubic centimetres of pale cod-liver oil had been given in sixteen days, and which was killed fifty-two days after the last injection. Thirdly, in a guinea-pig to which eight cubic centimetres of brown cod-liver oil had been given in sixteen days, and which was killed sixteen days after the last injection. Fourthly, in a guinea-pig to which one cubic centimetre of oleic acid (chemically pure) had been given, and which was killed forty-three days after the injection. The amount of oil required to cause death in guinea-pigs varied considerably. One guinea-pig died eight days after receiving four cubic centimetres of white cod-liver oil; another died twenty-three days after two cubic centimetres and a half; a third, which received eighteen cubic centimetres in thirty-six days, survived; it was killed thirty days after the last injection, and was found to present the adhesions in the peritoneum above described. One cubic centimetre of pale cod-liver oil killed one rabbit in six days; five cubic centimetres killed another in thirteen days; twenty-five cubic centimetres killed a third in fifty-two days. Two rabbits, to which six cubic centimetres and a half of brown cod-liver oil had been administered, died in fifteen days; one to which six cubic centimetres had been given died in twenty-five days; another died, after receiving nine cubic centimetres, in thirty-six days; another, after two cubic centimetres and a half, in six days; another, after four cubic centimetres, in eleven days; another, after six cubic centimetres and a half, in twenty-two days; another, after seven cubic centimetres and a half, in twelve days; another, after four cubic centimetres and a half, in thirty-seven days; and another, after twelve cubic centimetres, in twenty-eight days. A guinea-pig, to which one cubic centimetre of oleic acid, as usually sold, was given, died the same day; another, which received one cubic centimetre and a quarter, died in three days; two others, which received one cubic centimetre, died in four days; another died in fifteen days, after receiving one cubic centimetre; another in seventeen days, after one cubic centimetre and a quarter; another in nine days, after one cubic centimetre; another in eight days, after four cubic centimetres; and another in six days, after four cubic centimetres. One guinea-pig died in seven days, after receiving one cubic centimetre of olive oil; another died in thirteen days, after receiving one cubic centimetre and a half of colza oil; another in thirty-one days, after four cubic centimetres of cotton oil. One died in forty-seven days, after receiving six cubic centimetres of oil of *Fagus sylvatica*; and another died after receiving three-quarters of a cubic centimetre of crude petroleum oil. In the case of rabbits the effects of subcutaneous injections of oil were considerably less severe. After receiving half a cubic centimetre of oil every day for a month these animals were killed. They all presented the fatty lesions and adhesions observed in the guinea-pigs, but in a minor degree; and they appeared to be perfectly healthy. In every case there were oily tracks in the peritoneum, around the liver, kidney, stomach, spleen, and costal insertions of the diaphragm, but there were no adhesions in these organs. The stomach alone was attached by somewhat loose bands to the parietal peritoneum. A few patches of fat were found on the liver and spleen. The fatty infiltration of the large omentum gave it the aspect of a loosely-woven net. The rabbits which received similar doses of crude petroleum oil presented abscesses at the spots where the inoculations were made, and the same fatty lesions, rendered more apparent by the black color of the oily tracks. Some black spots were also noticed on the lungs. Most of these animals were in good condition at the time of their death. Several of them increased in weight during the period in which the experiments were made.

THE TREATMENT OF DIABETIC COMA.

The production of diabetic coma has been referred to the development of various complicated organic acids in the economy, and, if the supposition as to its mode of production is correct, the administration of alkalies is evidently indicated. Cases are on record in which the intravenous injection of a three per cent. solution of sodium carbon has proved successful. DR. HESSE reports in the *Berlin. Klinische Wochenschr.*, No. 19, 1888, a case of a man, 42 years of age, with 4.1 per cent. sugar in his urine, in whom, in one hour

after the onset of coma, a little over 8 ounces of four per cent. solution of carbonate of sodium were injected into the veins; the coma gradually gave way to quiet sleep, and the patient soon awoke in a perfectly conscious condition. On the following afternoon somnolence again set in, and the patient died before a second injection could be administered. Although in this case it does not appear to have saved life, yet its favorable influence seems to be beyond doubt, since spontaneous disappearance of diabetic coma never occurs.

Reviews.

STUDIES FROM THE LABORATORY OF PHYSIOLOGICAL CHEMISTRY, SHEFFIELD SCIENTIFIC SCHOOL OF YALE UNIVERSITY, FOR THE YEARS 1887–1888. Volume III. Edited by R. H. Chittenden, Ph.D., Professor of Physiological Chemistry.

New Haven: Tuttle, Morehouse & Taylor, Printers.

Until very recently the abstract sciences, which underlie medicine, have been so excluded from the United States that the appearance of any new volume which is at all creditable to our civilization still sends a thrill of pleasure through the nervous system of those who have been accustomed to mourn the barrenness of Israel. We, therefore, hail with much delight volume third of the studies from the Laboratory of Physiological Chemistry of the Sheffield Scientific School, published under the auspices of Professor R. H. Chittenden, and wonder somewhat that this series has not received the praise or gained the notoriety which it deserves.

The present volume, which contains about one hundred and fifty pages, and is a handsome specimen of American book manufacture, is composed in all of nine original papers, of which five are of special interest to the therapeutist. The first of these papers by Professor Chittenden and Dr. Alexander Lambert considers the physiological action of the uranium salts, the conclusion being reached that uranium is an irritant poison of remarkably slow action, producing, when ingested in sufficient amount, gastro-intestinal irritation, with a very pronounced acute parenchymatous nephritis.

Urethan, paraldehyde, antipyrin, and antifebrin are considered by Professor Chittenden, on the bases of experiments made by Messrs. N. P. Washburn, J. E. Dockendorff, H. F. Adams, and H. C. Taylor, to have a quick and very distinct influence upon the excretion of nitrogen, and when in large doses, also of phosphorus and sulphur. So the conclusion is that when urethan is taken in small quantities it exerts an inhibitory influence on proteid metabolism, while after larger doses the inhibitory action of the drug on proteid metabolism is still more pronounced. Paraldehyde was found not to have any distinct action on tissue-waste; but antipyrin had a decided inhibitory action on the proteid metabolism of the healthy human being, which is in opposition to the results obtained by Dr. Kumagawa (*Virchow's Archiv.* Band cxiii.). Acetanilide, or antifebrin, in the doses employed, appeared to increase proteid metabolism.

Professor Chittenden and Dr. Stewart found that antipyrin, antifebrin, and urethan have very little or no influence upon the amylolytic action of the ferment of human saliva; but that paraldehyde has a strong inhibitory action, and that the thallin sulphate, if present in very minute amount, stimulates the action of the ferment, although a .2 per cent. solution almost entirely stops such action. It was also shown that caffeine and theine have very little influence upon the proteolytic action of pepsin-hydrochloric acid; that antipyrin and antifebrin have a decided inhibitory influence; that urethan has a slight retarding action, and paraldehyde and thallin sulphate a very decided stimulating action.

In a few experiments Professor Chittenden and J. A. Blake found that small doses of antimonious oxide, long continued, tend to increase the body weight, and particularly the weight of the liver. The increase in liver weight is accompanied by an increased percentage of fat and a slight increase of liver glycogen; while, on the other hand, from corresponding doses of arsenious oxide, the results would indicate a diminution in body weight, liver weight, and also liver fat.

Professor Chittenden and Mr. Charles Norris, Jr., have made some experiments on nickel and cobalt. They find that free soluble salts are decidedly toxic, but slow in action, and requiring large amounts to produce fatal results. They both act in disturbing the alimentary canal, and especially by depressing the heart. A portion of the administered doses was quickly absorbed and quickly eliminated by the kidneys; but a large part of the dose passed directly through the alimentary canal. A rather remarkable fact was that the spinal cord and brain, in the majority of experiments, stood first in their power of picking up and retaining nickel and cobalt.

A Text-Book of Human Physiology. By Austin Flint, M.D., LL D., Professor of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York. Fourth edition. New York: D. Appleton & Co., 1888.

To those to whom the mention of Flint's "Physiology" recalls his first work published in five volumes, or even the bulky condensation which constituted the second edition, the present edition of his work will appear as a new book. An examination of the work warrants the author's claim that it is entirely rewritten. The long historical discussions, which were of but little profit, and which occupied so large a part of the early editions of this work, have been wisely omitted, together with descriptions of apparatus and methods, which can but little enhance the value of a text-book. With the exception of chemical questions, which can hardly be regarded as the strongest part of his book, Dr. Flint's new edition appears to be thoroughly up to the times. Well-established facts in physiology are concisely stated in such a form that they can be easily comprehended by students. The work is handsomely illustrated with three hundred and sixteen diagrams, while its typography, paper, and so on, leave little to be desired.

Correspondence.

CINCINNATI.

(From an Occasional Correspondent.)

Muscular atrophy due to lead-poisoning was an interesting case shown by Dr. Eichberg to the Cincinnati Medical Society. The man worked at stone-cutting, and used much putty, from which he was poisoned by the lead it contained. This was followed by wrist-drop and great atrophy of the deltoid. One could lay the finger between the ulna and radius. He worked up to eight weeks ago, but has been unable to work since that time. The doctor thought that on account of the rapid changes which were in progress there had been some change in the gray matter of the spinal cord, probably in the anterior horns.

The recent epidemic of yellow fever in Jacksonville was the subject of a report by Dr. L. C. Carr at the Cincinnati Medical Society. Dr. Carr was introduced by the President in a neat speech, in which he welcomed the doctor back in safety from the field of action at Jacksonville, where he had well earned honors not only for himself, but also for the profession to which he belonged.

Dr. Carr said that his observations led him to the belief that if the specific poison of yellow fever be transferred to a locality it will spread if there is sufficient heat and moisture, and that one of the most favorable conditions to its spread is a state of panic. The period of incubation he believes to be from twelve hours to five days. If asked, Is yellow fever contagious? he would answer, No, not in the common acceptation of the term. Camp Perry was the highest and most beautiful spot in Florida. No single case developed in Camp Perry proper. There were at all times one hundred employés, all unacclimated and exposed continuously to the yellow fever. Sand Hills Hospital did not develop a single case, except where the nurses went into Jacksonville for a short time. One of these remained only twenty minutes and contracted the yellow fever. The doctor stated it as his belief that, while a person might convey yellow-fever poison from one point to another, still, unless it finds sufficient heat and moisture, and what else it may need, it cannot develop yellow fever. He firmly believed that yellow fever had been in North Florida since last January. They have had "dandy" fever, "society" fever, and malignant bilious fever all this time, with a mortality of six per cent., which is in excess of the mortality from these diseases. The doctor's conversion to the germ theory in the origin of yellow fever was thorough and complete. There is no doubt that yellow fever attacks first the intestinal tract, and travels through the stomach, liver, spleen, and kidneys. He always found the inner coat of the stomach blackened on autopsies. He was in bed five times while in Jacksonville. The first time was after fifteen days, and he thought it malarial poisoning. He was attacked with black stools, which were quite frequent, and he was over it in a day. He thinks the bilious diarrhœa saved him from the yellow fever. Gibier took him to the hospital, and showed him what he claimed as the germ of the yellow fever. Gibier claims that cold will not kill the yellow fever, but that a temperature of 110° will kill it. Dr. Carr found no trouble in the lungs in any autopsy that he made. He found the spleen normal, the heart showed signs of fatty degeneration, the liver gave the boxwood appearance, and the pelvis of the kidney was solid in every case. The bladder was empty, excepting some precipitated albumen. The temperature in one case

reached 111°, and still the patient recovered. If the albumen in the urine is white, it is a bad symptom. If the albumen is gray, tinged with bile, it is more favorable. The doctor attended one hundred and seventy-two cases, and in no case was albumen absent from the urine. In one case it did not appear till the fifteenth day, and in some it appeared before the chill. The early appearance of the albumen is an unfavorable symptom, and only one case recovered in which it appeared on the first day.

Treatment of yellow fever he found to be necessarily empirical. We do not know just what we are treating, but if we can carry the patient through the fever, we stand a chance of saving him. The doctor's choice method of treatment was to give in the onset of the disease 4 ounces of castor oil and a few drops of turpentine, and cover the patient with a blanket. He used a great deal of antifebrin, —4- or 5-grain doses every few hours. This kept up a gentle sweat, and kept the fever under control. He gave as a drink a mixture of half a grain of bichloride of mercury, two drachms of bicarbonate of sodium, in water. He also gave the carbonated water. If there are kidney complications, he gives the diuretic which seems to be indicated. If there is no kidney complication, and the per cent. of albumen not over fifty, he gives no diuretic. At the fifth day the battle commences with the patient, and it is then that the services of trusty nurses are so in demand. The craving for drink which the patient endures is beyond expression. The patient will drink if certain that it will kill him, and he demands the closest watching. The pulse is not consistent with the temperature, and generally runs about 100. He did not use quinine unless there was malarial tendency. No negro died of yellow fever. One was thought to have died of this complaint, but the autopsy showed this a mistake. This class of people suffered very much from that phase of the disease locally known as "rational" fever,—that is, when they asked for rations. The popular treatment among the laity is to sweat the patient; and they carry it to a terrible excess. He had seen patients sweating at a temperature of 94°, but he did not see it long. Dr. Broadus, of St. Louis, introduced an excellent method of stopping this sweating. He would strip the patient of all clothing, take a palm-leaf fan, and quietly and steadily fan the patient. The sweating would stop, the temperature begin to rise, and steadily improve till about normal again. This worked like a charm, and many lives were saved by it. Dr. Carr promised at some future date to give his ideas more fully on the subject, especially with reference to the management of the finances and care of the people, than he had been able to do on this short notice.

As to the disease being more readily contracted in the night-time, he said: "Travellers landing on the coast of Mexico at Vera Cruz, if they landed at night, and passed through the city when yellow fever was prevalent, were almost certain to contract the disease. During the epidemic at Jacksonville about forty persons made it a practice to go to Pabloe Beach on the four o'clock boat, and remain there overnight, returning in the morning for business. Not one of these forty who kept up the practice acquired the disease. Several who discontinued it and slept in town contracted yellow fever. The general opinion is that the vomit is blood. The question as to whether the disease returns is still in doubt. He had one patient who claimed to have had the fever in 1878, but he had not yet been able to communicate with the doctor who treated him. He could give very little information concerning the nature of the germ, but it looked like a yeast spore. The nurse Ansel Wood, who went there from Cincinnati and died, the doctor thought died from a strangulated hernia, which was overlooked."

The paper was discussed by Dr. Comegys, who dwelt on the kidney complications, and Dr. Norton, who had attended two cases of yellow fever brought to this city in 1848.

BERLIN.

(From our Special Correspondent.)

At the last meeting of the Berlin Medical Society, Professor Küster, the surgical director of the Augusta Hospital, delivered an address on the "Treatment of Pleural Empyema," in which he brought forward a method of treatment based on his own experience, which differs considerably from the therapeutic measures of treating this disease at present commonly employed in Germany. At the fifth meeting of the Congress for Internal Medicine, held in 1886, in Wiesbaden, the question as to the treatment of empyema provoked considerable discussion, in which the most eminent German clinicians took part, the views which Professor Fraentzel then advocated on the subject being universally accepted as outlining the general plan of

treatment, and the principles of treatment which he then formulated may be regarded as representing the method of treatment universally followed in Germany at that time. His method may be stated in a few words as follows:

Fraentzel first started with the assumption that under no consideration should a case of tubercular empyema be subjected to operative measures, with the single exception that in desperate cases puncture may be performed to relieve immediate danger of suffocation. In other cases he advocated puncture, and when repeated operations did not serve to produce a cure, he then recommended simple partial resection of a rib in the front part of the thorax and removal of the pus by washing out the pleural cavity. If this did not succeed, he then recommended the introduction of a catheter in order to break up adhesions, so as to permit of exit of the pus from the pleural cavity. Should the temperature rise to any great extent, he then recommended the performance of a second incision in the posterior wall of the thorax, which, as in the case of the anterior incision, should not be located too far down in the thorax. It is only very recently that certain clinicians, among whom Kussmaul and Naunyn may be mentioned, have recommended a much more radical operative procedure. Professor Küster, on the other hand, advocates the treatment of purulent pleural exudation based on quite other principles, and recommends a method which he has defended since 1873, previous to the time when Estlander, who is generally acknowledged to have the priority in this respect, published his method of surgical treatment of pleural empyema. The principles on which he bases his mode of procedure are the following: In the thoracic cavity the bony thorax forms one wall; between the ribs are stretched the soft parts which are capable of a certain degree of movement; while the other wall of the pleural cavity consists partly of the lungs and partly of the pericardium, if the empyema is on the left side, and partly of the diaphragm. The inner wall is thus formed of extensible, or, at least, movable organs. If, now, it is imagined that the lungs are so compressed as to admit of no further displacement, it is evident that a reduction of the cavity may be possible either through ascent of the diaphragm or a depression of the intercostal tissues, though it is evident that a complete obliteration of the cavity can never take place in this way.

It is evident, then, that, to accomplish cure by obliteration of the pleural cavity, attention must, in the first place, be directed towards regaining the expansibility of the lungs, and that this is only possible when the compression of the lungs has not been of long duration. The indications for therapeutic interference are, therefore, self-evident. Operative interference is called for at the earliest moment possible, and the opening should be so located that the pus may be completely and spontaneously evacuated In other words, the opening into the pleural cavity must be at its most dependent point, and so treated that the sides of the incision do not fall together and so interfere with the free exit of the pus. Professor Küster bases his method of treatment on the above fundamental principle, and has met with the most surprising results. His studies include notes of one hundred and nine cases, thus constituting the most extensive experiments yet published by any single physician. They differ further from all other published statistics in that they, without exception, include both the successful and unsuccessful cases. Thus, for example, they include a very large number (thirty-two) of cases of tubercular empyema which were almost dying when brought upon the operating-table, and, in addition, a number of cases complicated with other diseases, which were almost to be regarded as inevitably fatal. Taking into consideration the nature of his cases, Professor Küster's results were extremely favorable. Sixty cases were completely cured (fifty-five per cent.); seventeen cases were not cured (sixteen per cent.); thirty-two cases died (twenty-nine per cent.). In the cases which were cured are only included those which either did not report subsequent to their discharge, or in which subsequent examination proved not only that the cavity had been completely obliterated, but that the external fistula was fully healed. Those cases were regarded as cured which were discharged with a thoracic fistula, provided they did not subsequently come under treatment, since in all probability cases belonging to this category were subsequently healed. Professor Küster's cases might be divided into the following six groups:

First.—Uncomplicated empyema,—that is, pure traumatic empyema; those cases where the empyema followed recovery from infectious disease; cases of empyema following pneumonia, measles, and scarlet fever are included in this group, and are the cases which in the clearest manner demonstrate the value

of the operation. This group comprised thirty-nine cases, of which thirty-four were completely cured. Four cases died, of which one died from carbolic acid poisoning, an accident which, in the present method of antiseptic treatment, could scarcely occur. One case was discharged uncured, and no information could be obtained as to his subsequent history.

Second.—Cases of chronic empyema,—that is, cases in which suppuration had lasted longer than six weeks. Of the seventeen cases belonging to this group, eleven were cured, three died, and three were discharged uncured.

Third.—Cases which had been previously unsuccessfully treated, in which a single incision had been made resulting in thoracic fistula of several months' duration. Further, cases are included in this group in which, without any operative treatment, either an external or a bronchial fistula had formed. Of the fifteen cases belonging to this group, eight were healed, six died, one remained unhealed.

Fourth.—Cases with pulmonary gangrene, consequently cases which ordinarily are regarded as quite unfavorable for treatment. Of the three cases belonging to this group, two died, one was cured. Another case which is included among the tubercular cases partly belongs to this group, since in opening the pleura a portion of pulmonary tissue as large as the fist was extruded and removed. This case also was healed.

Fifth.—Cases complicated with diseases which were themselves to be regarded as almost invariably fatal. Cancer and basilar meningitis, three cases, comprise this group, and all died.

Sixth.—Tubercular empyema. Of thirty-two cases forming this group, six were healed, fourteen died, twelve remained unhealed. The fatal cases, with one exception, are not to be attributed to the operation, but the patients died after long treatment in the hospital from progressive tuberculosis and from amyloid degeneration of the kidneys. That, however, six cases were cured is a remarkable result, since the cases of cure of tubercular empyema are but rarely met with; and further, the cases which come under the treatment of the surgeon, are almost always in the last stages. Even if no single case had been cured, Professor Küster regarded it as a satisfactory result, in that the condition of the patients was greatly improved, and, since they were enabled to sustain the presence of a thoracic fistula, their sufferings were greatly relieved. Professor Küster's method may, therefore, be formulated as follows: Operate as soon as possible, through the resection of one or more ribs, making the opening in the most dependent portion of the pleural sac, so as to permit the ready and constant evacuation of the purulent contents of the pleura.

BERLIN.

(From an Occasional Correspondent.)

A Unique Case of Acromegaly—A Girl with Two Hundred and Fifty Cherry-Stones in her Intestines—New Observations with Sozoiodol—Myrtol as a Disinfectant of the Air-Passages—The Drawbacks of Creolin—Results of Extirpation of the Stirrup-Bone—Gran Canaria—A Cure for Red Hands—A Case of Leprosy—A New Suspensory.

The immense crowd of physicians and surgeons who thronged the hall of the Berliner Medicinische Gesellschaft at its meeting of January 16 indicated that an event or demonstration of unusual interest was to take place. Professor Virchow presented on the living subject the extremely rare affection known as acromegaly (*τὸ ἄκρον*, the extremity; *μεγάλος*, large), and made it the subject of a highly interesting essay. Your correspondent has stenographed the entire discussion, and begs to present its essential features to the readers of the GAZETTE.

Acromegaly, as the name indicates, is an excessive growth of the extremities, in which the head usually participates, and the affection is to be regarded as a partial giant-growth. Professor Barry, of Paris, has given the affection its present name, though a few single cases have been described in earlier times. Professor Virchow admitted that he had never seen similar dimensions on any human being. Before entering into the details of that remarkable case, Professor Virchow briefly alluded to some similar cases coming under his observation. He showed the skeleton and various casts of extremities belonging to a man who died in the Royal Charité last year. Both the skeleton and the casts showed enormous dimensions, which, however, as was soon to be seen, did not even approach those of Virchow's patient. Various observers, particularly Professor Freund, of Strasburg, believe in a certain relation between this affection and the sexual apparatus, all the more as the most pronounced phenomena of acromegaly appear to coincide with the period of puberty.

Virchow himself doubts the existence of such relations. The daughter of the man whose skeleton was shown showed the same anomalous growth, though only 11 years of age. There seemed, however, to be an hereditary element in the affection, as suggested by the above cases of father and daughter and two others which occurred in Heidelberg and were described by Professor Friedreich.

The patient before the Society is an exceedingly robust and large man, perfectly healthy, and father of six children. He cannot state at what period of life acromegalous symptoms began to develop in him, but he remembers that when quite a little boy his teacher had once remarked that he would surely be enlisted in the Prussian guards. His lifting capacity is truly enormous, for he lifts with ease and pleasure EIGHT HUNDRED POUNDS. The head of the man shows gigantic proportions, in all directions defying all his hitherto collected anthropological experience. The skull of the giant measures in circumference 65.5 c.m., in length 22.9 c.m., and in width 16.8 c.m. These figures are far in excess of those taken from other gigantic individuals, such as Murphy and Winkelmeyer, the two well-known giants of Castan's Panopticum (in Berlin), and a Prussian guardsman. While the height of Murphy's body was 7.1, of Winkelmeyer 6.3, and of the guardsman 6.7 times the length of the foot, the comparative index in this instance was only 5.8. His absolute height is 183.8 c.m. The pathological process in acromegaly is not only confined to the bones, but extends also over the soft parts. The view that cartilages and adipose tissue are principal factors in this condition is erroneous. The affection has a certain similarity with myxœdema, but differs from it in the fact that in the latter the bones are never involved. Acromegaly cannot possibly be confounded with leontiasis ossea, as the facial bones do not assume in the former affection the appearances characteristic of the latter. The distinction between acromegaly and osteitis deformans (described by Sir James Paget) lies in the degeneration of bones symptomatic of the latter disorder.

To add to the above remarkable, if not unique, case the history of another singular case, your correspondent quotes the following statement from the *Berliner Tageblatt* of January 17: A girl, 22 years of age, died suddenly in the Friedrichshain City Hospital of Berlin, and was subjected to a post-mortem examination. The autopsy revealed a truly marvellous and almost incredible fact: the lower portion of the small intestines contained no less than two hundred and fifty cherry-stones and three plum-kernels. Authentic medical authority vouches for the truth of this remarkable statement.

It is a noteworthy and fortunate fact that the incessant and morbid chase after new remedies which is characteristic of the present therapeutical era has, momentarily at least, stopped, a more accurate examination of the recent pharmacal acquisitions having taken its place. Quite notable in that direction are the extended observations of Dr. Nitschmann, of Erfurt, on the medicinal virtues of sozoiodol. This new drug was first introduced by Trommsdorf, a chemist of Erfurt, and recommended by Professor Lassar, the well-known Berlin dermatologist, as a local application of great energy in parasitic skin-affections. Fritsche obtained very satisfactory results with sozoiodol in nasal and pharyngeal disorders, using it partly alone and partly combined with sugar of milk. Nitschmann himself has used the new remedy successfully on mucous membranes with the brush or in douche form in solutions of five to seven per cent. Langgaard, the assistant of Professor Liebreich, declared sozoiodol as a non-poisonous drug which may be applied even to the denuded skin without danger of intoxication. In spite of the powerful antiseptic virtues of sozoiodol Nitschmann does not recommend its use as a simple antiseptic in bruises and lacerations on account of its being more expensive than other equally prompt antiseptic agents. In severe and putrescent injuries, however, such as are particularly frequent in factories and machine-shops, sozoiodol presents distinct advantages. The drug combines astringent with disinfectant properties, and is, therefore, particularly eligible in cut-wounds produced by a dirty or rusty knife, in which the *prima intentio* has failed, in bruises produced by toothed wheels or instruments, in burns caused by liquid metals, in superficial burns following an explosion, and in chronic ulcers of the leg. Nitschmann formerly used in granulations iodoform, and applied nitrate of silver if the granulations became too luxuriant, followed again by the application of iodoform to counteract too severe a cauterization. This treatment, besides producing black margins of the wound and an unpleasant odor, had the disadvantages that the patient had to be examined daily, an exigency which, particularly in the country, is next to impossible. In all such

cases an ointment prepared from sozoiodol is a happy medium between the two applications mentioned above, and gives excellent results. The wound is easily kept clean, and presents a healthy, red color, without luxuriant granulations. Nitschmann has by the application of a sozoiodol ointment healed extensive wounds in from four to five days, which, by the old treatment required two weeks or more to heal. In two burns subsequent to an explosion, in which the injuries presented almost identical features, Nitschmann treated one case with iodoform and the other with sozoiodol, and found that the healing process under the influence of the latter application proceeded twice as fast as under the former. His formula for the sozoiodol ointment is:

℞ Sozoiodol, ʒx;
Lanolin, ʒi. M.
F. ungt.

Another field of great usefulness for sozoiodol are chronic catarrhs of mucous membranes. A watery solution of five per cent. of sozoiodol zinc painted over the parts every two hours is a safe and prompt application in acute pharyngeal catarrh or acute stomatitis. If the application proves too burning, pure water may be applied after the painting. The drug proved likewise valuable in many cases of acute conjunctivitis appearing during an epidemic of measles at Erfurt. After the application (like after the use of $ZnSO_4$), however, cold water washes should be employed for fifteen minutes. In purulent conjunctivitis and blennorrhœa neonatorum sozoiodol sodium may be advantageously substituted for sozoiodol zinc as a less painful application. Nitschmann's formula for these cases is:

℞ Sozoiodol sodium, gr. xxx;
Aquæ, fʒi. S.

In gonorrhœal urethritis the application of sozoiodol zinc* is quite useful, on account of its combining astringent with disinfectant properties. An important and successful field for the application of sozoiodol is vaginitis. True, in cases where daily examinations and applications can be made, the use of the speculum and direct cauterization with acetum pyrolignosum or nitrate of silver give the best results. But in cases where a daily treatment is impossible, a tampon saturated with a sozoiodol sodium salve (1 to 10) is an application equally grateful as useful. In catarrh of the cervix (Emmet's ectropium) the drug, applied in form of the powder has given highly satisfactory results. The drug being but little soluble when applied as a powder to the cervical region, forms a rather permanent, and therefore very effective, application. The powder is best blown on the part† by means of a glass tube, at one end of which a rubber mouth-piece is fastened. In endometritis a concentrated solution (seven per cent.) applied by means of Braun's syringe has in the hands of Nitschmann proved very successful. It is, however, indicated to make an application of water immediately after the cauterization, in order to prevent the entrance of the drug into the peritoneal cavity through the tubes in case of intervening cramps. In vaginismus pruritus a five per cent. solution of sozoiodol zinc is useful. In rheumatism sozoiodol lithium has been used, but its degree of usefulness has not yet been ascertained.

Of equal interest as Nitschmann's observations with sozoiodol are the clinical researches of Professor Eichhorst, the widely-known therapeutist of Zürich, made with another new remedy,—viz., myrtol,—which is recommended as a disinfectant of the air-passages. Myrtol is a perfectly clear fluid, and represents that constituent of oil of myrrh which boils at 160° to 170° C. Linderm is the only clinician who has instituted any detailed trials with myrtol. Eichhorst himself was first to apply it in gangrene of the lungs. The results which he obtained were so surprisingly favorable that he has used the drug in numerous cases, and is now convinced that as a disinfectant of the air-passages myrtol has not its equal. The drug is best given in gelatin capsules (à .15, prepared in Paris, or by Pohl, of Schönbaum-Danzig). If a capsule is crushed, the peculiar odor clings to the room for a long time, and if a capsule is swallowed, the breath emanates the characteristic odor for many hours, and often for a couple of days. In putrid bronchitis and pneumonic gangrene two to three capsules should be taken every two hours to deodorize and disinfect the parts. The effect is rapid, and a few capsules suffice to remove the bad odor, and often to produce a permanent improvement. The drug is, however, apt to cause a temporary loss of appetite. Myrtol has also been tried against tuberculosis, but the drug has proved utterly useless against the bacillus tuberculosis.

* In a two per cent. solution.

† Through the speculum.

Les extremes se touchent. While extolling the virtues of some new remedies, it will not be amiss to call attention to the drawbacks and disadvantages of another new drug, which of late has become quite popular,—viz., creolin. Although the disinfectant properties of creolin have now been definitely proved, the drug has certain disadvantages which contraindicate its use for certain purposes. The solution of creolin is wholly opaque, hence it cannot well be used for the basin, in which the instruments are placed before an operation, as it renders their finding difficult. Another disadvantage is that it renders everything with which it comes in contact so soapy that it materially interferes with the firm hold on instruments and parts to be operated upon. That creolin is by no means a harmless agent, but can give rise to serious intoxication, has been amply proved by the publications of Rosin and Cramer.

A very interesting case from a physiological point of view recently came under the observation of Professor Berthold. A young woman suffered from an otorrhœa, as result of which the stirrup-bone of the ear had to be removed on the right side. The left ear did not show any hearing properties at all. After the operation, during which no labyrinth-water came away, serious disturbances of balance appeared, such as have been noted in pigeons in which the semicircular canals were injured. The perforation of the drum membrane was mechanically closed, and the woman did not hear when spoken to from the neighborhood, but she could hear whispering from a distance of fifteen feet. This singular phenomenon is obviously of interest from both a physiological and a surgical point of view, though it may not be easy to find an explanation for it.

Gran Canaria, with the capital Las Palmas, on the Canary Islands, is enjoying the distinction of attracting the consumptives from all parts of the continent, and will soon contest with Davos and Denver City as a resort for phthisical patients. The air in the Palm City is dry and the days uniformly sunny. The temperature is nearly constant at 26.1° C. from November up to May, the daily medium variation being only 5° C. Besides, rain is almost unknown in that region; in seven months, for instance, it rained only once, and that at night. The town is pretty and living is cheap, good hotels giving full board at the rate of two dollars and a half per day. These advantages render Las Palmas the ideal sanatorium of consumptives.

The question, How can the physician, in spite of daily contact with the erosive effect of antiseptic and other chemicals, preserve a white and smooth hand?—a question of considerable interest to all disciples of Æsculapius,—has been satisfactorily answered by Dr. G. Meyer, of Berlin, according to a method devised by Professor Liebreich. The hand is to be washed with an easy lathering centrifugal soap, and to be dried very carefully. Then a small quantity of lanolin is rubbed into the hand. Liebreich's formulæ are:

1. ℞ Lanolin, ʒii;
Vanill., gr. iss;
Ol. rosar., gtt. i.

2. ℞ Lanolin, ʒii;
Paraff. liquid., ʒvss;
Vanill., gr. iss;
Ol. rosar., gtt. i.

The salve is best kept in a little tin box (such as is used for colors) from which the contents can be squeezed out at any time. The salve can easily be removed from linen soiled with it. The cause of the action of the ointment is the absorption of all water left from the washing and an absolute drying of the hand. Besides, the hand becomes covered with an impermeable fatty coating, which prevents the tearing or fissuring of the cuticle. (Lanolin is also used to remove wrinkles from the face.)

A case of leprosy, the second ever seen in Berlin, has attracted a good deal of attention from the Berlin profession. The patient, a young man of 26, hails from Galveston, Texas, and was sent here for treatment. He is at present under the treatment of Professor Lsasar, who, without having produced anything approaching a cure, seems, nevertheless, to have improved the condition of the patient.

Your correspondent saw a suspensory recently in a Berlin hospital, which he regarded as a decided improvement over the old form. The principal feature of innovation was that the fixation of the suspensory was obtained by bands worn around the shoulders, on the plan of suspenders, which prevents the slipping of the suspensory.

A new and useful order has recently been published by the government forbidding circumcision as a religious rite to be executed by other than regular practitioners of medicine. Hitherto, as is well known, this operation has been always executed by Hebrew officials who had no medical education.

PARIS.

(From our Special Correspondent.)

In the speculations of contemporary therapeutists *strophanthus* still holds a foremost position. The complex effects of the drug indicate a plurality of chemical principles, and last month M. Catillon, one of the strophanthus faithful, announced that he had discovered a distinct principle, appearing to be the diuretic element of the drug. The substance in question contains nitrogen, is not poisonous, and is probably not an alkaloid, as it forms with lime a soluble combination from which it is separated by muriatic acid. That it is distinct from strophanthine—one might almost say strophanthines—is shown by the mode of extraction, which consists in exhausting the seeds with strong alcohol to extract strophanthine, and macerating the residue with lime and water, filtering, separating the excess of lime with carbonic acid, and evaporating in vacuo. The product is soluble in water and in alcohol weaker than seventy degrees, and is considered an amide by M. Catillon. Experiments made on himself and rabbits proved the substance to possess powerful diuretic properties. The discovery, although not of capital importance, is of some interest, as it brings out some tangible facts, while the question of strophanthus and strophanthines still remains perplexing. The active principles appear to be for the present abandoned by general consent, but considerable diversity of opinion is still manifested by practitioners respecting strophanthus itself. Dr. Germain Sée having spoken ill of the African plant, Dr. Bucquoy, on January 8, read at the Academy of Medicine a warm defence of it, much lauding strophanthus in cardiac effections, and relating quite a series of cases successfully treated with Galenic preparations of the seed. Next, on the 15th, before the same learned assembly, Dr. Dujardin-Beaumetz spoke rather favorably of strophanthus, adding, however, that he has obtained with *extract of oleander* results perfectly identical with those of strophanthus, the only difference being that larger doses of oleander are necessary. And, lastly, at the same meeting, Dr. Germain Sée began, in answer to the foregoing, to read a grand communication, which will only be concluded during the sitting of January 22. So it appears French therapeutists are not yet near agreeing about strophanthus.

Muriatic acid poisonings are not unfrequent, but it is seldom their effects are observed as carefully and under such favorable conditions as the following. The accident occurred some time last May, but it gave rise to painstaking investigations and experiments on animals, which are only now related by Dr. Letulle, of the Tenon Hospital, and his interne, M. H. Vaquez. The patient, a man aged 58, while tipsy, swallowed by mistake a whole tumblerful of commercial spirit of salt. A physician, called in at once, gave emetics, which acted freely and greatly relieved the patient, who, two days after the accident, was transferred to the Tenon Hospital. There it was observed the man appeared to suffer but little from the stomach, and chiefly from the lungs. A few hours after his admittance, and after he had swallowed without difficulty soup and milk, the patient died suddenly, without vomiting once. A thorough post-mortem, described with great care and minuteness, developed the following unexpected state of affairs. No traces of burning were apparent on either the bucco-pharyngeal cavity or the œsophagus, save, perhaps, a slight red tinge on a portion of the latter. The stomach was more affected, being much inflamed and indurated, but it was not perforated, and certainly the immediate cause of death was to be looked for elsewhere. As the duodenum and intestines were unaltered, it was evident the acid had not penetrated farther than the stomach. But the lungs were deeply injured. They showed, besides the traces of an old chronic broncho-pneumonia, violent inflammation of recent origin, which was the real cause of death. To explain such an effect it is to be supposed the acid found its way there in more than one manner,—first, when the poison was swallowed, the fumes, with possibly a few drops, got into the lungs; and secondly and chiefly, the efforts while vomiting, when under treatment, caused more of the caustic liquid to penetrate through the air-passages. Several experiments performed since then on animals have demonstrated the correctness of the theory, but they have shown also that when the acid touches only the stomach the animal will survive several days, with a tendency to probable recovery, while sudden death during the experiments can readily be traced to inflammation of the lung. The conclusions reached by Drs. Letulle and Vaquez are, that (1) in cases of poisoning with caustic liquids like muriatic acid less is to be feared from their action on the stomach than from the introduction of small quantities into the lungs; and, therefore (2), in accidents of the sort,

emetics should be avoided, and rapid stomach washing with appropriate solutions substituted. To which pepsin theorists would, perhaps, add a third conclusion,—namely, that all this proves muriatic acid to be the free acid of gastric juice, otherwise the stomach would not stand it so well.

While on the subject of poisonings, a strange case recently occurred here, which created no little sensation, and hitherto remained a mystery in some of its features. It is only accidentally that the truth has been discovered, and the THERAPEUTIC GAZETTE will be the first to publish it, as French papers will for the present keep mum on the affair. Last fall, a young scion of nobility, but only a non-commissioned officer in the army, the Baron de Carayon-Latour, was taken sick while at the Chalons camp, and sent to the Mourmelon Military Hospital for treatment. To hasten his cure, he prevailed upon one of the nurses to get him from the pharmacy some subnitrate of bismuth. This being against the rules, the man simply gave him a white powder, folded in a wafer; but, soon after taking the dose, young De Carayon-Latour was taken with symptoms of violent poisoning, which he concealed to save his comrade from punishment. At last, his state being evidently desperate, he obtained permission to be transferred to his family residence in Paris, where he died the next day. Of course an inquest was held to find out the cause of the accident, but nothing satisfactory transpired. The autopsy showed clearly enough the young officer's death to have been caused by some mercurial compound, but it remained impossible to explain how the poison could have got within reach of the good-natured but ignorant *infirmier* (nurse). The poisons were proved to have been, according to rule, kept in the poison closet, and the key thereof never to have left the possession of the military pharmacist in charge. It is only the other day that the truth came out, and it carries with it more than one lesson. It seems a sergeant attached to the hospital pharmacy, being chemically inclined, had been trying to make Pharaoh's serpents' eggs, and rubbed in a mortar some sulphocyanide of mercury, obtained outside, which the nurse mistook for bismuth subnitrate,—they are much alike,—and gave to deceased. As soon as trouble arose, the sergeant threw away the sulphocyanide, and kept his own counsel, much to the embarrassment of the authorities. Yet he finally spoke out, and was court martialled this week. The judgment was one of acquittal, on the ground that sulphocyanide of mercury is not a recognized poison. The fact is, only one case, and that not fatal, is recorded against the chemical. Lime-water and iron by hydrogen were the antidotes. One important lesson to be drawn from the foregoing is, that *sulphocyanide of mercury is a poison* liable to cause death when no antidote is administered. The others are the more commonplace maxims that ignorant people should not meddle with chemicals, and, finally, that a patient should hide nothing from his physician.

A rather novel case of *tape-worm cure* occurred recently in Spanish Navarre, near the French frontier, a place where people are reputed to be rather handy with the knife. A man, during an argument, received a stab in the left meso gastric region, and through the cut a part of the intestine, opened by the same stab, protruded. The surgeon, on dressing the wound, noticed a paste-like substance issuing, and, on closer inspection, identified it as a part of a tape-worm. Since he had it thrust on him, the physician carefully pulled out the parasite, which proved to be entire and to measure five metres (sixteen feet) in length. The patient being robust and healthy, the wound healed up in six days, and he was thus cured of tape-worm without medicine. It is scarcely likely, however, the treatment will ever become a popular one for the cure of tape-worm.

Phloridzin has long retained a place in materia medica without being employed much at any time; but, like all things kept long enough in a house, it has found a use. Dr. Quinquand has been making experiments with it to determine the action of glucosides in general, and phloridzin in particular, on the economy, and succeeded in producing with phloridzin temporary glucosuria. When the chemical in question is injected into the veins or into the stomach, or even simply swallowed, in quantities ranging from one per thousand to one-fourth of one per thousand of animal weight, the urine is, after fifteen minutes, found to contain notable quantities of glucose. Many experiments instituted with glucosides have led Dr. Quinquand to divide these principles into two categories,—first, those which cause the formation of less glucose than the theoretical quantity contained in the glucoside administered; and, second, those which, like phloridzin, give rise to a passing glucosuria, and occasion much more sugar to be voided through the

urines than has been introduced in the shape of glucoside combination. Another interesting feature is that when phloridzin is administered the resulting glucosuria is accompanied with no increase of glucose in the blood. It may be useful to add also that with the doses above mentioned the animals are occasionally troubled with vomitings, but promptly recover.

After thus reviewing the progress of therapeutics, a branch of medical science, it may be piquant to relate on the science itself the views of a confirmed sceptic. Dr. Peter, a member of the Academy of Medicine, a professor at the faculty, and a bitter opponent of Pasteur's theories, the other day exposed his convictions, or the lack of them, as follows: "During my long career I have witnessed the birth and death of many medical theories. I saw the last days of Broussais's phlegmacy doctrine, next the heyday of the numerical theory, then Virchow's embolies, and, later on, all affections attributed to reflex action. So I have become something of a philosopher. In our days we have seen the birth of microbian theories already lapsing into an alkaloidal action, and thus taking us back from solidism to ancient humorism. But, all taken together, some progress is made. Of Broussais we have kept the knowledge of irritation; from the numerical method we have learned greater precision; from Virchow, embolies; from Claude Bernard, the reflex actions; and from the microbian doctrines, the necessity of hygiene. Thanks to the last theories, many have learned it is decidedly very beneficial to keep clean, drink pure water, and eat healthy food." Rather scant praise for Pasteur. But, no matter what pessimists may say, the world does move, and medical science keeps marching onward.

PARIS, January 18, 1889.

ISO-NITROSO-ANTIPYRIN.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—A combination of antipyretics, such as antipyrin and spirits of nitrous ether, which at the same time stimulates both the kidneys and skin to excrete, is very prone to suggest itself to those to whom the reduction of temperature is much of a consideration. But the reactions of such a mixture appeal so very strongly through our senses to our prejudices that it is not strange that we should have been voluminously warned against it. In all these warnings there has been (so far as I know) no relating of experience nor statement of reasons, but rather *ipse dixit* utterances.

Clinically, I have used a mixture of antipyrin fifteen grains, spirits of nitrous ether thirty minims, in several cases of common continued fever during the past year. That these cases would have terminated favorably without it I believe, but that the compound failed to control the symptoms for which it was administered, or exhibited any toxic or deleterious effect, I am prepared to deny.

After so much had been written, I instituted a few experiments to better determine the truth. The data I append.

No. 1.—Subject, a cat, rather thin; young; weight, two pounds. Temperature at beginning of experiment was 102°. Gave hypodermically eight minims of an eight-months'-old solution of fifteen grains of antipyrin in thirty minims each of spirits of nitrous ether and distilled water. In three hours this was repeated. Temperature fell to 100°; no constitutional disturbance.

No. 2.—Same animal; one day later; temperature, 102°. Gave an hypodermic injection of a recently-prepared mixture of three grains of antipyrin, four minims of spirits of nitrous ether, and six minims of water. Temperature fell to 99½°; no constitutional disturbance.

Very respectfully yours,
G. EVANS, M.D.

ABERDEEN, MISS., December 31, 1888.

THE IODIDES IN SYPHILIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—An experience of ten years in hospital practice, comprising service in the University and Philadelphia (Blockley) Hospitals, service in the United States Marine Hospital Corps, and attending surgeon to the Sisters of Charity Hospital in this city the past seven years (rich in genito-urinary diseases), has given me a moderately large experience in the use of iodide of potassium, and in the treatment of syphilis in all its stages. The discussion between Drs. Wood and White, therefore, is of particular interest to me. Memoranda of my reply to the questions asked editorially were made *before* reading the articles in question.

Yours truly,
W. H. HEATH.

BUFFALO, N. Y., 415 Pearl St.

QUERY I.—My experience with the use of iodides in syphilis has been comparatively large. I see and have seen more primary and secondary than tertiary, and but little implication of the nervous system.

QUERY II.—I believe the susceptibility to the iodide of potassium is more pronounced during the secondary stage, and that it diminishes in direct ratio as the tertiary is approached.

I base this opinion on my observation that mild iodism is more apt to occur (and often does) when treatment is changed from a tonic mercury to mixed treatment during the secondary stage than when it, or iodide alone, is instituted during the tertiary.

QUERY III.—My experience confirms the generally held view that patients with tertiary syphilis bear larger doses of iodide of potassium, and bear it well, than healthy individuals or those suffering from other chronic maladies.

There is no better opportunity for comparing the tolerance of the drug in syphilis and other chronic maladies than in the Marine Hospital Service, where instances are constantly afforded of inability to push iodide of potassium in one disease, for instance, chronic rheumatism, while in the same ward, perchance the next bed, a case of late syphilis will be taking enormous doses and thriving upon it.

I have, however, seen cases of rupia and late syphilis unable to take iodide of potassium, save in very small doses, and the remedy have no effect. These cases were improved and finally cured by iron, cod oil, bichloride, and change of climate.

(I do not believe, for this and other reasons, that iodism is evidence of the non-existence of the specific taint.)

Notes and Queries.

HEREDITARY SYPHILIS.

According to the Vienna correspondent of the *British Medical Journal* for January 12, 1889, at a recent meeting of the Imperial Royal Society of Physicians of Vienna, PROFESSOR NEUMANN read a paper on "Hereditary Syphilis." The questions with which the lecturer dealt were the following: 1. What is the condition of the offspring when the father and mother were healthy at the time of conception, and the mother became infected at a later date (pure post-conceptional syphilis)? 2. What is the effect of post-conceptional syphilis with reference to the offspring when the father was already syphilitic at the time of procreation? 3. What is the effect of post-conceptional syphilis with reference to the offspring when the condition of the father's health at the time of procreation was unknown, and the mother was healthy at the time of conception, and became infected at a later date? 4. What is the condition of the offspring when the infection and the conception took place at the same time? And, 5, when the infection of the parents occurred before conception? Professor Neumann's paper was based on cases most of which he had observed during eight years in his clinic. Of these, only one hundred and two were available for the purpose he had in view, as accurate data concerning the offspring could not be obtained in the rest. The physicians of the three obstetric clinics of the General Hospital and those of the Vienna Foundling Hospital also took an active part in the investigation. With regard to pure post-conceptional syphilis, Professor Neumann had observed eleven cases; of these, five were healthy, and the rest, in part, presented the appearances of syphilis, and, in part, miscarriage occurred. As regards post-conceptional syphilis, where the father was syphilitic, five children were found to be healthy, two children were affected with syphilis, and in five cases miscarriage had occurred. In the cases of post-conceptional syphilis, where the father was unknown, there were ten healthy, one syphilitic, and seven dead children; two children were still under treatment. In the cases in which conception and infection took place at the same time, fifteen children were healthy, one died of peritonitis, four were syphilitic; the fate of these cases could not be ascertained, and in twenty-one instances still-birth occurred. Among twenty-five cases of syphilitic infection before conception, there were ten healthy children, eight cases of miscarriage, and four of maceration; three were still under treatment. Professor Neumann arrived at the following conclusions: 1. A syphilitic mother may convey the disease to her offspring at any stage of her affection, whether the infection had taken place before or after the conception. 2. A mother who had contracted the disease after conception sometimes transmitted it to the fœtus. In the case of pure post-conceptional syphilis the transmission of the affection to the child was extremely rare,

and particularly when the mother had become infected in the last months of pregnancy. 3. When the infection of the mother had taken place after conception, and the father was syphilitic at the time of procreation, the effect on the offspring was greatly intensified; the children in these cases died *in utero*, or were born with signs of syphilis. 4. In the case of post-conceptional syphilis, where the infector was unknown, the proportion was the same as in pure post-conceptional syphilis; syphilis acquired in the last months of pregnancy was usually transmitted to the offspring. 5. When infection and conception occurred at the same time, the children died in one-half of the cases. It was, nevertheless, remarkable that a great part of the offspring remained free of syphilis, in spite of the fact that the disease was in an active state in both the parents at the time of conception. This disproved the assertion that a healthy child could never be born when both parents were syphilitic at the time of conception. On the other hand, the assertion that healthy children were born only when the syphilis of the parents was seven years old was also negatived. 6. In the case of infection before conception, the period at which conception occurred had to be taken into account; the longer the interval between infection and conception, the more favorable was the prognosis for the offspring. 7. The offspring had the best chance when the mother only contracted syphilis in the last months of pregnancy, while the father was healthy at the time of procreation; the same was also true of the offspring of parents suffering from tertiary syphilis. The offspring had the least chance when infection and conception had occurred simultaneously, or when the father was suffering from recent syphilis at the time of procreation. 8. This last observation also elucidated the question as to paternal syphilis. It was especially these cases in which the father was syphilitic at the time of procreation, and the mother became infected only after conception, and the child was soon after the infection born in a macerated condition, which proved the extremely injurious nature of paternal syphilis. This was opposed to the observations of Boeck and Dewere, who stated that the child of a syphilitic father was always healthy. These data, concluded Professor Neumann, showed the sad fate of the children of syphilitic parents, as, out of one hundred and nine cases, only forty-four were born healthy, and, according to inquiries made by Dr. Friedinger, director of the Vienna Foundling Hospital, only the minority of them lived. Hereditary syphilis must, therefore, be considered one of the most terrible plagues of infant life.

LOCAL ANÆSTHETIC ACTION OF ANTIPYRIN.

Hypodermic injection of antipyrin has been strongly recommended for the relief of pain by Sée and others. Sée considers that it rivals morphine in the extent of its action, that it has not the unpleasant after-effects of that drug, and that it does not interfere with nutrition nor lead to a "craving." BERDACH has lately been experimenting with the drug in this way at Professor Bamberger's clinic at Vienna. He uses a fifty per cent. solution, in distilled water, and has experienced nothing but favorable results. All kinds of painful conditions were so treated, the injection being made at the most painful spot. For a few seconds after administration there is local pain and burning, but this soon passes off, and is followed by analgesia over an area of more than a centimetre round the point of injection. Fränkel and others had previously noticed this. The most important point in Berdach's observations is that the pain is relieved in a few seconds after the injection, the relief lasting for at least six hours. No disagreeable effects, such as vomiting, sweating, rash on the skin, or depression of the heart or pulse, were noticed, and in those patients that were febrile the temperature remained uninfluenced.—*Druggists' Circular*, January, 1889.

THE KIDNEYS IN DIABETES.

R. FICHTNER (*Virch. Arch.*, cxiv., Hft. 3) points out that among the lesions observed in the kidneys of subjects of diabetes, glycogenic degeneration or infiltration of the epithelia of Henle's tubes is one of the most constant, but yet difficult of explanation. Changes in the cortex have been less frequently met with; some have seen acute interstitial inflammation, leading even to granular kidney; others describe epithelial necrosis, especially in cases of diabetic coma, attributable to the action of acetone and diacetic acid. Fatty degeneration is described by various writers, notably V. Frerichs and Ebstein, the latter meeting with marked fatty change and free fat between cells. Fichtner, in two cases of diabetic coma, found, in addition to the

glycogenic degeneration of Henle's tubes, very marked fatty degeneration of the cortical epithelium, the fat globules and particles being in each case regularly arranged along the periphery of the cells just beneath the basement membrane; and those tubules solely were affected which contained cloudy epithelium. The epithelia of other parts, as well as the glomeruli and the connective tissue, were apparently normal; and there was no indication of necrotic or inflammatory change. The absence of inflammation was remarkable, especially in one of the cases, which during life presented albuminuria and renal casts, and was, therefore, considered to be a case of chronic nephritis, with diabetes. The peculiar type of fatty change had been met with by Fichtner in a case of chronic nephritis following alcoholism, but in that case many tubules exhibited a more diffuse degeneration than the variety described. In cases of phosphorus-poisoning the cells are filled with fat globules of various size and grouping. In seeking for an explanation of the lesion, he remarks that both these patients died comatose, and had the peculiar odor of the breath indicative of acetone and diacetic acid in the urine. Having regard to the previous observations of Albertoni and Pisenti, as well as of Ebstein, which point to the connection between epithelial necrosis in the kidney and the presence of these substances in the urine, it is highly probable that the special kind of fatty degeneration must be referred to these or allied bodies. If fatty degeneration occurs apart from coma, its cause must be found in the excess of sugar. The subject is open to experimental research, which may throw some light upon the subject of renal secretion.—*Lancet*, January 5, 1889.

COMPRESSION OF THE BRAIN AND SPINAL CORD.

Formerly it was assumed that as an axiom that brain-tissue was practically incompressible, and the symptoms caused by increase of the intracranial pressure were supposed to be due to cerebral anæmia. Experiments on animals, however, prove that these suppositions are wrong. For the volume of the brain can be diminished by pressure, and this diminution is not due to narrowing of the blood-vessels, but to the displacement of fluid from the cerebral tissue into the subarachnoid space, and thence into the cord and the lymphatics and veins of the neck. When the pressure is below a certain limit, but yet sufficient to materially lessen the bulk of the brain, the cerebral blood-vessels actually dilate. The dilated vessels supply sufficient nutriment to the compressed tissue, and there are no functional disorders of the parts of the brain involved. When the pressure is below the limit at which functional disorders appear, our author considers the compression to be of the first degree. In compression of the third degree there are visible breaches of continuity; in other words, the brain is crushed or bruised. Between compression which causes no functional disorders, and compression which produces structural lesions, lies compression of the second degree, in which the damage done to the tissues is said to be molecular or dynamical, because it cannot be detected by the microscope. While compression of the second degree lasts, there are pronounced functional disorders, but complete functional restitution follows on the removal of the compressing force. ADAMKIEWICZ (*Wiener Medizinische Wochenschrift*, Nos. 41, 42, 43, October, 1888) found in animals that when the compression just attained to the second degree, irregular attacks of clonic spasms of the opposite side of the face and opposite limbs (contralateral hemiclonus) appeared. As the pressure was increased, hemispasm was replaced by hemiplegia, muscular contraction, and exaggerated tendon reflexes. Paraplegia followed hemiplegia, and spastic tremors and paralytic trembling were observed as the compression approached and passed into the third degree. In man, as is well known, cerebral tumors may remain latent, or give rise to hemispasm, hemiplegia, paraplegia, and spastic phenomena. In our author's terminology, cerebral tumors cause compression of the first or second degree. Adamkiewicz has cited elsewhere cases to illustrate the disappearance of hemispasm and hemiplegia when the tumor or other cause of increased intracranial pressure was removed. In the following extraordinary case he was enabled to observe the immediate effects of compression on the human brain. A young countryman had a large soft sarcoma removed from the top of the head. The tumor had eaten through the bone, and by the operation the dura mater was exposed over an area of twelve to eight centimetres. The hole in the skull was filled with a firm tampon, and on this a board was placed to support weights. The greater part of the tampon was forced within the cranium, but no symptoms were produced by placing a

weight of seven kilogrammes on the board. Hence in man, as in animals, when the brain is compressed to a certain degree, its volume is diminished, but no functional reaction ensues. Other observations of the author confirm this result. To return to the case under consideration: A few weeks after the first operation, a second was undertaken, to remove the tissues infiltrated by the growth. The longitudinal sinus was opened, and great pressure had to be applied to stop the hemorrhage. As long as the patient remained fully under the anæsthetic all that was noticed was that the breathing was stertorous and irregular. But half an hour after the application of the compress paroxysmal attacks of screaming set in. A hemispasm accompanied each screaming fit. The hemispasm was confined to the left arm and leg, and consisted of rapid flexions. The closed fist was drawn towards the forearm and the forearm hurled towards the upper arm. In the lower limb the movements were confined to the hip and knee-joints. Each fit lasted two or three seconds, and the interval between two consecutive fits was four to five minutes. The patient died about an hour after the operation. At the autopsy it was found that the superior parietal lobules had been injured by the surgeon's knife, and that the upper third of the ascending frontal convolution and posterior part of the first frontal on the right side were so flattened that the furrows were completely obliterated. The corresponding region on the left side was flattened, but not to the same degree or extent. Adamkiewicz argues that the flattening was due to the pressure of the compress, and that the hemispasm was caused by the compression of the upper right motor region in front of the fissure of Rolando. He concludes that there are three degrees of compression of the human brain, characterized by the same phenomena which he observed in his experiments on animals.

Compression of the spinal cord has been supposed to cause myelitis by producing anæmia, and consequently disorders of nutrition and necrosis. But Adamkiewicz finds that this fundamental premise of the doctrine of the so-called compression myelitis is false. He shows that in man tumors may alter the shape and lessen the volume of portions of the cord without causing any functional disturbance, and therefore without materially interfering with the nutrition of the compressed tissue. In rabbits he introduced slips of laminaria between the dura mater and wall of the spinal canal, and thereby not only altered the outline and diminished the volume of the adjacent parts of the cord, but greatly deflected the paths of the nerve-fibres. In spite of this, the normal functions of the cord were performed for months. Hence compression of the cord, which stops short of bruising, causes neither anæmia nor inflammation. Myelitis associated with compression is not due to pressure, but to the simultaneous presence of irritants, such as the products of caries of the vertebræ. A case of spinal curvature is related as an example of compression of the second degree. The lower cervical and upper dorsal regions were involved in the curvature, and the symptoms were paraplegia and slight vasomotor disorders. As there were no indications of caries, no affections of the sensory nerves, no changes in the reflexes or electrical reactions, nor the slightest bladder or rectal trouble, it was supposed that there was neither myelitis nor any break in the continuity of the tissue. When the patient was suspended from the axillæ an immediate improvement in the movements of the legs took place, and the paraplegia became directly as bad as ever when the suspension was interrupted and the weight of the body no longer tended to straighten the curved column.—*Medical Chronicle*, January, 1889.

ALBUMINURIA OF PREGNANCY AND PUERPERAL ECLAMPSIA.

Dr. Lantos, of Buda-Pesth, has recently made a series of observations on albuminuria of pregnancy in the wards of Professor von Kézmársky. In over eighteen per cent. of seventy pregnant women he found albumen in the urine, while in nearly sixty per cent. of six hundred newly-delivered women the urine was albuminous. Albuminuria was detected in over seventy per cent. of two hundred and sixty-eight primiparæ, and over fifty per cent. of three hundred and thirty-two multiparæ. The percentage was distinctly lower in premature labor, and fifty per cent. lower in abortion cases. Out of ten cases where albumen was abundant, so that Dr. Lantos used the microscope, he found pus in three and casts in five, but no foreign elements in the remainder. He examined the kidney in thirty-nine cases where the patients had neither died from eclampsia nor from nephritis. In fifteen of these cases the kidneys were very anæmic, in twenty-one pale, and only in three full of blood. Among the local changes in other

cases he found acute parenchymatous nephritis in two cases, acute hemorrhagic nephritis in one case, parenchymatous degeneration in nine cases, and in four albuminous degeneration.

Dr. Lantos, therefore, concludes that, putting aside all evident and probable cases of nephritis in pregnant women, albuminuria is not rare in pregnancy, and very common after parturition. He refers the phenomenon to reflex irritation of the vaso-motor nerves of the renal vessels; it has no pathological significance, and, in conjunction with other symptoms, is a valuable diagnostic sign of pregnancy. Out of fourteen thousand eight hundred and fifteen labors observed in the course of fifteen years, he noted fifty-three cases (.36 per cent.) of puerperal eclampsia, a ratio of two hundred and seventy-eight to one. Over seventy-eight per cent. out of forty-two eclamptic cases occurred in primiparæ, over twenty-one per cent. in multiparæ; fifteen out of the entire fifty-three died.

Dr. Lantos thinks that the rate of mortality is increased when instruments are used, and as the convulsions often do not cease after delivery, he thinks that the forceps should not be used unless there be strong indications. Convalescence is much prolonged after eclampsia. In twenty-three of the eclampsia cases the urine was examined; in twenty-one it was albuminous, casts being found in four. At the necropsies of fatal cases of convulsion, Dr. Lantos found constant changes in the brain, but only once acute, though frequently chronic, renal changes. Like Osthoff, he traces puerperal eclampsia to violent reflex vaso-motor disturbance, and classes it as acute peripheral epilepsy. The original monograph, well worth the attention of obstetricians, is to be found in the *Archiv für Gynäkologie*, vol. xxxii. part 3.—*British Medical Journal*, January 12, 1889.

A CASE OF POISONING WITH CANTHARIDES.

Dr. Garcia Camba states in the *El Siglo Medico* (*Lyon Médical*, December 30, 1888) that last June he was called to see a woman who complained of severe pain in the bladder and urethra, and great difficulty in the emission of urine. During his visit the husband and the daughter, aged 8 or 9 years, were affected with the same symptoms. On interrogation, it was found that these individuals had recently roasted and eaten a half-dozen young birds which they had found in a nest. By accident they had preserved the intestines and gizzard, and, on opening these organs, Dr. Camba found them filled with small brilliant particles, among which he recognized the fragments of the elytra of *Cysta vesicatoria*. An emulsion of camphor and friction with belladonna ointment led to the cure of the three patients.

THE ABSOLUTE SIGNS OF DEATH.

At the meeting of the Medical Society of London, held December 10, 1888, Dr. B. W. Richardson read a paper on this subject (*British Medical Journal*, December 15, 1888). He opened by saying that in the present day, owing to the discussions that were taking place on the subject of cremation and the disposal of the dead, members of the profession were more frequently being called in in consultation in order to determine if life were actually extinct. He proposed, therefore, in the short essay he was about to read, to state in a very practical form, first, the common circumstances under which the inquiry was demanded; secondly, the methods for determining the absolute proof of death; thirdly, a summary of efficient practical details. Under the first of these heads the author specifies the reasons which led the friends of persons supposed to be dead to question the fact of death. These were: (*a*) changes of color of the dead body; (*b*) retention of warmth; (*c*) movements of parts, or supposed movements; (*d*) retention of life-like expression after death; (*e*) prolonged preservation of the body from putrefactive decomposition; (*f*) suspension of the ordinary phenomena of vital action after some forms of induced narcotism; (*g*) the cataleptic state, traumatic and idiopathic. One other circumstance might also give rise to the inquiry,—namely, a request on the part of the person while living to be subjected to skilled examination after death, in order to prevent the possibility of living burial. The author twice in his career had been called in to meet this demand or request. The various circumstances which might lead to a doubt as to absolute death, some of them very important and singular, were next described in detail; and then followed the second part,—namely, the actual or veritable proofs that had to be made in order to arrive at a satisfactory demonstration that life was extinct. These proofs were named as ten in number.

They were taken up in the following order: (1) respiratory failure, including absence of visible movements of the chest, absence of respiratory murmur, and absence of water vapor from the breath; (2) cardiac failure, including absence of arterial pulsation, of cardiac motion, and of cardiac sounds, absence of turgescence or filling of the veins on making pressure between them and the heart; (3) reduction of the temperature of the body below the natural standard; (4) rigor mortis and muscular collapse; (5) coagulation of blood in the veins; (6) putrefactive decomposition; (7) absence of red color in semi-transparent parts under the influence of a powerful light; (8) absence of muscular contraction under the stimulus of an electric or galvanic current; (9) absence of a red blotch on the skin after the subcutaneous injection of ammonia; (10) absence of signs of rust (oxidation) of a bright steel needle after plunging it deeply into the tissues. In the last part of his paper Dr. Richardson indicated the precise mode in which the practice named above should be directly applied, taking up the steps of the necessary examinations one by one, pointing out the relative values of each, and giving, so to speak, in a condensed form, the diagnostic formula for an absolute proof of death in every doubtful case, without any operative procedure that was itself inimical to life.

The PRESIDENT complimented Dr. Richardson on his interesting and elaborate paper. He thought the method of compressing the veins at the back of the wrist was a very simple and efficient method. He remarked on the fact that execution by electricity had been decided upon in the United States, a fact which, in view of Dr. Richardson's conclusions, might have untoward results.

DR. ROUTH mentioned that persons who died of pneumonia retained the coloration of the cheeks; and recalled an incident at Clamart which had forcibly impressed the fact upon his memory. Passing on to the question of temperature, he mentioned a case of ovariotomy in which the temperature rose two degrees after death, and even the next morning, though it was in the winter, the temperature was still two degrees above normal. He also referred to the post-mortem movements in patients who had succumbed to Asiatic cholera.

DR. ALTHAUS alluded to the universal dread felt towards being buried alive. He observed that the occurrence of a post-mortem rise of temperature was a recognized fact, notably in tetanus. In other cases, again, there might be a remarkable fall in temperature before life was extinct, so that temperature *per se* could not be relied upon to prove anything. He had known the temperature to go down to 93° within twenty minutes after an apoplectic attack, and the same phenomenon was often observed in wasting diseases and as a consequence of inanition. He mentioned one such recorded case, in which the temperature fell as low as 81° F., though the patient was undoubtedly alive. In his opinion, the only really reliable test, except putrefaction, was the reaction of muscles to electricity. In no disease, short of death, was the contractility of muscles absolutely destroyed all over the body at the same time. He said that very soon after the heart ceased to beat a steady and perceptible diminution in the extent to which the muscles responded to the electrical current was noticed, and all trace of reaction disappeared in about two hours, certainly within three hours. It persisted longest in powerful men the victims of violent death. He mentioned a case in which this test had proved conclusively that the patient was dead.

The PRESIDENT asked Dr. Richardson how he accounted for the facts observed by himself and others on the battle-field of the occurrence of instantaneous rigor mortis in soldiers. He had seen them preserve the attitude in which they were at the moment of death, the arms raised as in drinking, or holding the musket, etc.

DR. RICHARDSON, in reply, observed that he had protested against the introduction of death by electricity as being altogether unreliable. He quoted a series of experiments made on sheep, and showed that while it was possible, by means of a very powerful current, to kill small animals, birds, etc., it was quite otherwise when large animals were experimented with. He said that he had asserted that the color in the cheeks persisted in death by asphyxia, to which category death from pneumonia belonged. He alluded to the fact that no one could, by will, impose on the survivors any particular method of disposing of the body by cremation or otherwise. He thought the discretion rested with the executor (Dr. Routh claimed that wife or next of kin was the authority in such matters), and suggested that the legal right to leave directions in this respect might fairly be applied for. He denied that rigor mortis ever produced any change in position, all the muscles undergoing the change simultaneously. In

reply to the President, he said that the sudden rigor in the cases mentioned was probably due to the immediate coagulation of the albuminous constituent of the body, due to the heat developed by the sudden resistance offered to the circulation.

DRUG ADULTERATION.

The Committee on Drug Adulterations appointed annually by the State Pharmaceutical Association, and consisting this year of H. M. Whelpley, St. Louis; J. A. Gallagher, Kansas City; D. L. Haigh, St. Louis; R. T. Thornton, Rich Hill; R. S. Hughes, Odessa; earnestly request the assistance of the members in their important work.

A cordial invitation is also extended to pharmacists not members of the association and to the physicians of the State to assist in the work. At the last meeting of the State Association, the Committee on Drug Adulterations was instructed to extend this committee to any extent deemed proper, and to interest the pharmacists and physicians of the State in the importance of its work and the direct good accruing from it.

It is the intention of the committee, therefore, to try and ascertain as far as possible how near the official substances dispensed in this State conform to the requirements of the United States Pharmacopœia. If each druggist in the State would select one official substance, and procure a sample in his vicinity, and apply to it the pharmacopœial tests, the sum total of results thus obtained would be of incalculable value. The tests of the United States Pharmacopœia are very simple and especially adapted for use in retail stores.

It is not desirable that the report of this committee shall be composed of intricate chemical analysis of substances of no special interest to druggists, but it is earnestly desired that it be a report that represents practical value to each druggist and physician in the State.

Reports of work done for the committee will be tabulated, and read before the association at the next annual meeting at Pertle Springs, June 18, 1889, and full credit will be given to persons having performed the work.

Those who have articles suspected of adulteration can send them to the committee, if they themselves have not the time to examine them.

Address the chairman,

H. M. WHELPLEY,
No. 113 Market Street,
St. Louis, Mo.

GLYCERIN SUPPOSITORIES.

BOAS recommends glycerin suppositories instead of small enemata of glycerin. They may be made by dissolving 10 parts of dialyzed stearine soap in hot water, mixing the solution in 90 parts of pure glycerin, filtering in a steam filter, evaporating down to 100 parts, and pouring into moulds. They may also be made with cacao-butter.—*Medical Chronicle*, January, 1889.

THE TREATMENT OF BURNS BY COCAINE AND LANOLIN.

DR. WENDE recommends in the *Journal de Médecine de Paris* the use of an ointment of hydrochlorate of cocaine and lanolin as a dressing for burns. By this mixture not only is perfect occlusion obtained, but pain is almost immediately arrested. It is necessary, however, that the cocaine be pure, and that the ointment be recently made.

THE TREATMENT OF NIGHT-SWEATS BY THE EXTERNAL USE OF CHLORAL.

According to the *Gazette Médicale*, DR. NICOLAÏ has obtained good results in the night-sweats of the phthisical by the employment of an embrocation of hydrate of chloral, two drachms dissolved in a tumblerful of brandy and water. Every night about bedtime the patient is rubbed all over with a sponge dipped in this solution. Sometimes three or four rubbings suffice to effect the complete disappearance of night-sweats, which have previously lasted for weeks.—*Boston Medical and Surgical Journal*, January 10, 1889.

EFFECT OF ANTIPYRIN IN THE SECRETION OF MILK.

In the *Medical News* of December 8, DR. T. HAVEN ROSS calls attention to the value of antipyrin as a means of suppressing the flow of milk. He relates a case in which the daily dose of 24 grains was very effectual.

AN IMPORTANT CORRECTION.

In the notes by Dr. H. C. Wood on "Nasal Bougies," published in our January number, it was stated that each bougie should contain one grain of cocaine and one-twentieth grain of atropine sulphate. It should have been stated, one grain of cocaine and one one-hundred-and-twentieth grain of atropine.

—THE—

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PROPHYLACTIC HYGIENE.

LECTURE VII.—ON ISOLATION.*

BY PROFESSOR DUJARDIN-BEAUMETZ, PARIS, FRANCE.†

GENTLEMEN:—In two previous lectures we studied disinfectants and disinfection. We have still to examine another mode of prophylactic hygiene for opposing the propagation of infectious diseases,—namely, isolation,—and I propose in this lecture to consider the grave questions connected with this subject.

I shall leave to one side all that pertains to legislation, as in a special lecture devoted to this subject we shall have to examine with some thoroughness the various means which government has instituted for arresting the spread of infectious diseases. But what I can assure you in this connection is that if in our country we have laws and measures extremely severe in their application to animals affected with epizoötic diseases, this is not the case in reference to man, and in this particular we are almost completely disarmed.

You should be cognizant of this strange and almost incredible fact, that while we have the right on the public highway to

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

† Member of the Academy of Medicine, Physician to Cochin Hospital, etc., Paris, France.

arrest a man who has become a nuisance or dangerous to his fellow-men by reason of arms which he carries, or the tumult which he occasions, or the outcries which he utters, we cannot prevent an individual affected with smallpox from perambulating the streets and spreading disease and death around him. You will see that in some foreign lands the inhabitants are much better off in this respect than we are, and you will understand the necessity we are under of adopting stringent laws.

Isolation must be examined under three aspects,—either it pertains to the individual alone, who must be separated from his family; or else it concerns a small number of individuals affected with the same disease, who demand collective seclusion; or it has reference to a large aggregation of people, who, on account of some epidemic, must be kept apart from the populations which surround them.

We shall examine successively individual isolation, collective isolation, and the isolation of cities or of entire peoples, the latter comprehending the sanitary *cordons** and the quarantines. But, before going further, we must first decide a knotty question,—to wit, For what diseases we ought to practise isolation?

We have before seen reason for the statement that, if every microbe-disease is not contagious, the converse is not true, and that we may with confidence lay down this law that all contagious diseases are microbe-diseases. For this reason, then, isolation should pertain to a great number of diseases, and embrace almost all the affections due to pathogenic microbes. But there are degrees of contagiousness, some diseases being eminently contagious, others less so, and the existence of these degrees has enabled us to establish divisions in relation to these maladies.

At the head of the eminently contagious diseases we must place diphtheria, and there is a general agreement in demanding rigorous isolation in this disease. Do not forget that diphtheria is one of the most fatal of affections, especially in Paris, and that each year the mortality in Paris from this disease exceeds two thousand, which corresponds to more than 1 death for every 1000 inhabitants. In 1882 the mortality attained the ratio of 186 per 100,000. Then come the eruptive fevers, and at their head is smallpox. In the case of measles and scarlet fever, the value of isolation is disputed by some authorities.

As for measles, Ollivier has endeavored to show the necessity of isolating children affected with this disease, by pointing out the ravages which measles make in children's hospitals. In fact, this affection, which is generally benign in children of good constitution, brings grave complications in those who are debilitated or predisposed to tuberculosis. There is, then, a real need of separating rubeolic patients in children's hospitals from other patients, but this isolation is much less urgent when you have to do with well-constituted children, and such as have inherited no tuberculous tendencies.

As for scarlet fever, there is a clear distinction to make between children and adults. In children, scarlatina is a very contagious affection. In 1886, at the Hôpital des Enfants Malades, there were admitted one hundred and thirty-two cases from outside, and eighteen cases subsequently occurred in the wards. At the Hôpital Trousseau, two hundred and two cases were admitted from without, and twenty-two cases were subsequently reported as occurring within. It is far from being a very contagious disease in adults, and the propagation of scarlet fever in our wards is so rare an occurrence that, since I have been physician to the hospitals, I have never seen a case of scarlet fever contracted in our wards from a scarlatinous patient, though, at our hospital Cochin, there is not a month that we do not admit such patients.

This is, then, to my mind, the least contagious of the eruptive fevers, and while recognizing the fact that in this disease in private practice individual isolation is obligatory, it is not so with hospital practice, where there are only adult patients, and I do not fear to take scarlet-fever patients into my wards.

By the side of these eruptive fevers we must place whooping-cough, which is also an affection eminently contagious. Whooping-cough is generally benign; does not take on a character of gravity, except in debilitated and delicate children. While in the city, deaths by whooping-cough are very rare, it is not so in some of the children's hospitals, as that of Enfants Malades, where, according to Ollivier, the mortality in 1886 was twenty-five per cent.

But where there has been less agreement and much contention is with reference to

* A line of soldiers to prevent communication with an infected district.—TR.

typhoid fever and tuberculosis; now that the bacillary nature of these two affections is well known, as well as their mode of contagion, it is no wonder that there is a disposition to isolate these affections.

In families, the isolation of typhoid patients can be easily carried out. Is it the same in our hospitals? Without denying that instances of typhoid fever may occur in our wards, this is, it must be confessed, a fact of exceeding rarity, and although some hospitals in foreign lands have instituted special wards for typhoid patients, I do not believe that isolation is here an absolute necessity from the point of view of good hospital management.

I must pronounce the same opinion with regard to tuberculosis. That it may be desirable in a certain measure to separate a husband or a wife suffering from a tuberculous disease from a partner who is healthy, and especially to forbid their cohabiting together, I freely admit; but that there is any necessity to found hospitals for the tuberculous, does not seem to me at all clear, for, if tuberculosis is really contagious, it requires, for this contagion to be effective, certain conditions which are very difficult of practical realization. If we undertake to isolate the tuberculous, we might about as well isolate all other diseases, pneumonia included, and hospital service under such conditions would no longer be possible.

To these diseases we must add the imported diseases, such as cholera, sudor Anglicus, yellow fever, the plague, diseases eminently contagious, and which urgently demand isolation.

Thus far I have only considered diseases purely medical. Surgery, in its turn, demands isolation for affections which are septic and eminently inoculable, and the same may be said of obstetrics, in the successful practice of which, thanks to the antiseptic methods and to the rigid isolation of puerperal affections, we have reduced to the lowest figure the mortality in our services of accouchement.

Having disposed of this first topic, let us now inquire how isolation is to be accomplished. I need say but little about individual isolation, as practised in the family. To place a patient in a large, well-ventilated chamber, to keep from him all persons who might contract the disease from which he is suffering, and to let only those come near him whose duty it is to wait upon him, is generally easy of execution, and all that is needed is the authority of the physician and the co-operation of the family to enforce perfect seclusion.

Individual isolation may be relative or absolute, and, with regard to the matter of relative isolation, permit me to insist upon that which tuberculosis requires. If I do not favor hospitals for the tuberculous, for reasons which I have given, I do heartily advocate the relative isolation of these patients. I believe that when in a household one of a married couple is tuberculous, it is dangerous for the two to occupy the same bed, or even the same bed-chamber. The same isolation is demanded for the offspring of tuberculous patients, who should not be allowed to sleep in the same room with their parents.

Such are the few remarks which I wished to make relative to individual isolation in the family. If there has been but little contention with regard to this kind of isolation, it is not so when we come to the matter of collective isolation. Under this head we have to examine questions of the gravest importance, and we will follow, if you please, the course adopted by Fauvel and Vallin in their able report on this question made to the International Congress of Hygiene in 1878, and which may be considered as a model of the kind.

We shall, then, have to study the three following points:

1. Does collective isolation augment the mortality of patients thus isolated?

2. Does this sort of isolation create centres of infection?

3. How ought this collective isolation to be practised?

On the first point, everybody is unanimous in recognizing that the aggregation into one place of individuals affected with the same contagious disease does not augment the mortality of these individuals, and I can in this regard give you figures which are demonstrative, especially with respect to smallpox and typhus.

Colin has shown us that during the terrible year of smallpox (1870–1871) the sanitary boards had succeeded in isolating all the smallpox patients of Paris in the Hospital of Bicêtre, which, during that year, received no less than seven thousand five hundred and seventy-eight persons sick with the disease. From October 12, 1870, to April 1, 1871, there were ten hundred and ninety-four deaths, giving a mortality of fourteen per cent., a mortality which is not greater than

that which is observed when no isolation is attempted.*

But England has given us the most important statistics in relation to this subject. This country has made great achievements in the matter of isolation, and, in particular, in respect to smallpox, and you will find in the remarkable study of Lutaud and Douglass Hogg on the insulated hospitals of England, very accurate and minute data on this subject.†

Consult the statistics furnished by the smallpox hospitals, and you will see that the mortality there is not greater than in cases and under circumstances where smallpox is not the subject of a collective isolation. For instance, glance over the statistics of Stockwell Hospital, one of the hospitals southwest of London, and you will see that the number of smallpox patients does not sensibly modify the mortality of that hospital.

STATISTICS OF THE STOCKWELL SMALLPOX HOSPITAL FROM 1871 TO 1876.

	Number of cases of smallpox.	Mortality.
1871.....	2288	18.6
1872.....	601	18.9
1873.....	64	18.9
1874.....	59	8.5
1875.....	89	19.0
1876.....	800	20.2

In this connection, we may also appeal to the statistics pertaining to the isolation of individuals affected with typhus, and we must still go to England to obtain these statistics.

At the London Fever Hospital in 1862, out of eleven hundred and seven cases of typhus exanthematicus aggregated in the same wards, there were two hundred and thirty-two deaths, giving a mortality of 20.95 per cent. During the same period, in the other hospitals in London, three hundred and forty-three cases of the same disease were treated, with a mortality of eighty (23.3 per cent.). The same proportion was kept up the following years, for from 1862 to 1865 seven thousand four hundred and ninety-eight cases of typhus exanthematicus treated in the isolation wards of the London Fever Hospital furnished a mortality of 18.57 per cent. During the same period four hundred cases treated in the common wards gave a mortality of 21.15 per cent. The question is then settled, and we may affirm to-day that the grouping together in a common ward of patients affected with the same infectious malady does not augment the fatality of the disease.

Much more difficult to solve is the second question,—namely, If hospitals of isolation for infectious diseases create centres of infection, and thus become a nuisance to the neighborhood of those hospitals?

In Paris, since the institution of hospitals of isolation for smallpox in connection with the general hospitals, it has been stated that numerous cases of smallpox have occurred in the immediate vicinity of those hospitals; and in 1870 this was said to be the case with reference to the Hospital Laennec on Sèvres Street, where the existence of the smallpox pest-house caused this affection to spread in the surrounding streets. The same year Delpech made two reports in regard to this matter to the Council of Hygiene, and this question came up anew before the Council a little while ago in reference to the smallpox hospital situated at Aubervilliers.‡ In a report presented to this Council I made known the reality of the facts.§

Créquy, moreover, in a report to the Academy of Medicine, October, 1887, "On the Epidemic of Smallpox, which Broke Out among the Workmen of the Gas-Factory of Aubervilliers," communicated some facts, which seemed convincing with regard to the propagation of the disease from this hospital of Aubervilliers to the employés of the neighboring gas-factory.

But it is again from English sources that we obtain the most demonstrative statistics on this point. The Asylum hospital and the smallpox hospitals have been, like our own hospitals of isolation, accused of creating centres of infection for smallpox, and to decide this question a royal commission was appointed.

The reply of this commission was as follows: "It appears to us clearly established by the experience of five smallpox hospitals during these last six years that in their actual state these pest-houses are a cause of the propagation of smallpox in their vicinity. At the same time, the commission gives its opinion that direct communication and by individuals may have had a more important part

* Colin, "Smallpox from an Epidemic and Prophylactic Point of View." Paris, 1883.

† Lutaud and Douglass Hogg, "Étude sur les hôpitaux d'isolement en Angleterre." Paris, 1886.

‡ Delpech, "On the Epidemic of Smallpox observed in Paris from 1865 to 1870."

§ Dujardin-Beaumetz, "On the Cases of Smallpox observed in the Eighteenth and Nineteenth Districts of Paris, and in the Communes of Aubervilliers, of Pantin, and of Saint-Denis in 1887."

in the propagation of the disease than the air itself."

Hill, Tripp, and Powers, in their reports, have come to almost the same conclusions, and I must call your attention especially to the report of this latter physician, who studied the influence of Fulham Hospital on the propagation of smallpox.

This hospital, situated in the region west of London, and which has fifty beds for smallpox patients, gave Powers a good opportunity to investigate the matter and ascertain in different zones traced around the hospital the number of houses infected, and I cite *verbatim* the figures given by Vaillant in the report of Chautemps to the Municipal Council on the necessity of the isolation of infectious diseases.

Proceeding upon this basis, he traced around the hospital four circles, having, respectively, for radii a quarter of a mile (four hundred metres), a half mile (eight hundred metres), three-quarters of a mile (twelve hundred metres), and one mile (sixteen hundred metres). The entire area included in the larger circle he called the special zone. He then divided the length of time during which Fulham Hospital remained open for reception of patients into five epidemic periods, and he examined relatively to each period the proportion of infected houses in the central zone, and in each of the zones of a quarter of a mile radius which surrounded it. The result was that in each of the epidemic periods the disease propagated itself around the hospital in zones of decreasing intensity, the decrease being in the ratio of the distance from the hospital, as is shown by the above table, where, as in the entire report, the term "acute" designates all the cases which had not arrived at the period of convalescence.

All these figures show you that with respect to smallpox, hospitals of isolation create centres of infection, and are liable to propagate the disease, and this the more actively the nearer the houses are to the hospital.

It remains now to consider the second point,—namely, How is this propagation effected? Is it by the air or by individuals? This question seems now to be settled. If the air of smallpox wards may contain, as Brouardel has shown,* solid particles coming from the crusts of dried variolous pustules, these particles cease to be found in the air which surrounds the hospital. Thus it is that Colin fixes at one hundred metres the distance at which the air ceases to be contaminated. According to repeated inquiries and investigations, it appears to be demonstrated that it is by direct contact that the propagation of this disease is effected, and, as has been well said, the *rum-shop* has considerably more to do with this matter than the influence of the atmosphere.

With respect to the hospital of Aubervilliers, it is chiefly a drinking saloon called the *Château of Alouettes*, situated near the gate of the hospital, and where the persons accompanying smallpox patients are accustomed to obtain liquor, which has been the active propagator of smallpox in the vicinity of this hospital. Add that certain subor-

Cases of Acute Variola admitted to Fulham Hospital, and the Percentage of Smallpox occurring in the Houses of the Special Zone and its Different Subdivisions during Five Epidemic Periods.

Cases of acute smallpox admitted.	In epidemic periods since the opening of the hospital.	Percentage of infected houses in the special zone and its subdivisions.				
		In the totality of the special zone.	In the small interior circle of ¼ of a mile.	In the first exterior zone of ¼ to ½ mile.	In the second exterior zone of ½ to ¾ mile.	In the third exterior zone of ¾ to 1 mile.
327	March, 1877, to the end of 1877.	1.10	3.47	1.37	1.27	0.36
714	January, 1878, to September, 1878.	1.80	4.62	2.55	1.84	0.67
679	September, 1878, to October, 1879.	1.68	4.40	2.63	1.49	0.64
292	October, 1879, to December, 1880.	0.58	1.85	1.06	0.30	0.28
515	December, 1880, to April, 1881.	1.21	3.00	1.64	1.25	0.61
2527	Five epidemic periods.	6.37	17.35	9.25	6.16	2.57

* Brouardel, "On the Conditions of Propagation of Smallpox" (*Soc. Méd. des Hôpitaux*, December 9, 1870).

dinates of the hospital (servants or attendants of the sick) have been in the habit of clandestinely leaving the hospital to visit their friends outside, thereby violating the rules, which require of them a change of wearing apparel before going outside of the hospital precincts, and have thus been a cause of the propagation of the disease.

Hence, my conclusion is as decisive as that which I gave to the first question which came up in relation to these hospitals of isolation, and I would express it in the following terms: "Rigorousness of isolation in the special hospitals for infectious diseases is the surest means of preventing these hospitals from becoming centres of infection."

Having disposed of these two questions, we find ourselves confronted by a third question,—to wit, How are we to carry out this collective isolation? Must we build special pest-houses in connection with our general hospitals? Must we have separate hospitals for each infectious disease? Lastly, Where shall we locate these hospitals of isolation?

In the long and remarkable discussion undertaken by Fauvel and Vallin at the International Congress of Hygiene in 1878, we find the following conclusions, which give a definite answer to the various questions which I have just stated:*

1. The isolation which is the nearest perfection is that obtained by means of a hospital set apart for one single disease, or for several diseases treated under separate roofs. It is also the most expensive and the most difficult to organize.

2. A separate building in connection with a general hospital gives less, though still sufficient, security. Such lazar-houses are more convenient and easily managed than when far apart. The managing of these insulated hospitals, however, so that there shall be no exchange or communication with the other buildings in the midst of which they are situated, is a matter of difficult realization.

3. Isolation of patients suffering from contagious diseases in separate wards contiguous to the common wards is better than no isolation at all, but it is a method which is likely to disappoint, and end in failure.

We should endeavor as far as possible to have special hospitals for the principal infectious diseases, and this is the conclusion at which Chautemps arrives in his report presented to the Municipal Council on the hospitals of isolation.†

But this matter of the establishment of hospitals of isolation brings up at once questions very difficult of solution. The necessity of locating these hospitals in large fields away from human habitations has led our city authorities to seek suitable situations in the suburbs. But to this the suburban communes raise violent opposition.

In the important report of Colin made to the Council of Hygiene in 1888, our colleague has shown the necessity of erecting these hospitals outside of Paris, and especially such as are designed for the protection of the community against smallpox, measles, whooping-cough, and diphtheria. "I am of opinion," says he, "that the establishment of such pest-houses, which shall be constructed according to the modern notions of hospital architecture, will not have any injurious effects on the health of the suburban communes.‡

But when you have established in the outskirts of our large cities hospitals of isolation for the more infectious and contagious diseases, you have not done all. The patients must still be carried to these hospitals, and every means must be taken to prevent them, by the very fact of this transportation, from becoming active agents in the propagation of the infectious disease. To meet this want, we have instituted services of transportation, by which patients are taken to the hospital in special vehicles designed exclusively for this use.

These vehicles are disinfected after each trip, and, as before stated, they are used for no other purpose. At the present day, London and Brussels, as well as Paris, are provided with a service of this sort. Duchesne, in a recent memoir,§ well describes the mechanism of our Parisian service. A depot or central station situated at the Hospital St. Louis, another at the Hôtel Dieu, enable the sanitary authorities to have the carriages at a moment's notice at their disposal; and, in order that you may judge of the importance of these transportations, I will quote the statistics of such conveyances during the second half of the year 1887:

* Fauvel and Vallin, *Congrès International d'Hygiène*, 1878, p. 676.

† Chautemps, "De l'organisation sanitaire de Paris," 1888.

‡ Colin, "On the Construction in Suburban Places of Isolation Hospitals," August 20, 1888.

§ Duchesne, "On the Transportation to the Hospital of Patients affected with Contagious Diseases" (*Bull. et Memoires de la Soc. de Thérapeutique*, 15 Juillet, 1888, p. 536).

	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Typhoid fever	20	33	45	25	64	63	250
Smallpox	96	120	80	75	97	108	586
Measles	10	5	4	1	5	9	34
Scarlet fever	47	25	12	24	13	20	108
Croup	10	11	9	22	15	22	89
Erysipelas	3	3	9	9	13	15	52
Other contagious diseases	6	7	11	4	4	9	41
	162	204	170	157	211	256	1160

Unfortunately, this transportation service, which has been in operation since 1881, is still but little known, and the eleven hundred and sixty patients above mentioned are far from representing all the cases of contagious affections which were taken to the hospitals during that length of time; and, if you refer to statistics, you will see that during the same period seventeen hundred and one patients affected with smallpox, measles, diphtheria, and scarlet fever found other means of transportation.

This is a deplorable fact, and numerous instances on record have shown what grave consequences the transportation of a patient affected with some contagious disease, as diphtheria, may have for other children who may happen at the same time to be riding in the same public vehicle, an omnibus, for example, or who may afterwards ride in the same carriage, the latter not having been disinfected.

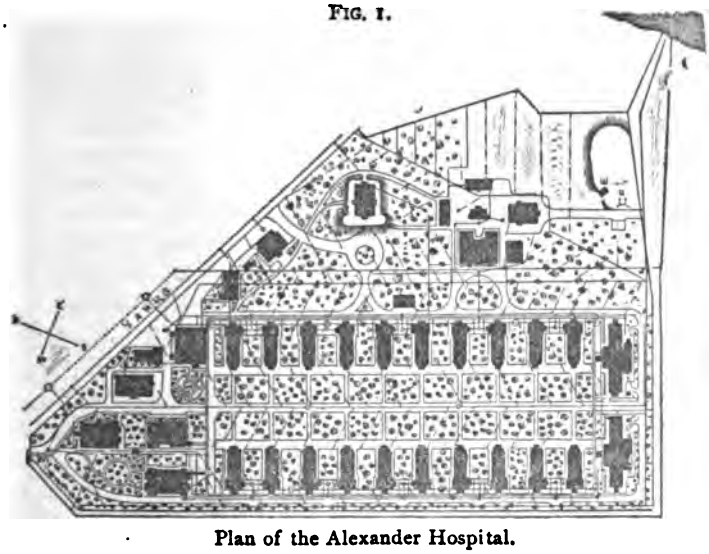
For less contagious affections, such as typhoid fever and tuberculosis, I do not believe that it is necessary to create special hospitals, but it is quite sufficient to group patients suffering from these diseases in wards by themselves, and this can be especially well effected in hospitals with insulated buildings.

The most complete arrangements of this sort that I have seen are in connection with the Alexander Hospital Barracks at St. Petersburg. In this hospital, a design of which I here show you (Fig. 1), each building, constructed on a uniform type, is destined for but twelve patients, and each is set apart for some special infectious disease.

These buildings, concerning which I have elsewhere written,* are elegantly built and furnished; their construction is peculiar, as you can see by the following cuts (Figs. 2, 3, 4, and 5)

In these hospitals with insulated buildings, this is the way the patients are received. If the disease with which the patient is affected is known at the time when he enters the hospital, he is transported immediately to the building set apart for that particular disease. When the diagnosis is doubtful, the patient is sent to the waiting ward (*salle d'attente*), where the disease is studied, and, when the diagnosis becomes positive, he is transferred to the pavilion destined for the malady from which he is suffering.

FIG. 1.



Plan of the Alexander Hospital.

* Dujardin-Beaumetz, in *Boston Medical and Surgical Journal*, January 3, 1889, page 23, "On the Russian Hospital Barracks, and, in Particular, the Alexander Hospital of St. Petersburg." See also the same Journal, February 21, 1889, page 201.

When a patient is admitted to the hospital, before entering the wards, and in the reception building, he is divested of his clothes, takes a bath, and puts on a suit of hospital clothing, while the garments that he previously wore are sent away to be disinfected.

The absence of corridors connecting these separate buildings, while rendering the medical service of the hospitals somewhat more laborious, is very favorable for the relative isolation of these infectious diseases. I believe, then, that this is the type of insulated pavilions that we ought henceforth to adopt in the construction of our future hospitals; at the same time I think that we might profitably increase the number of beds in each pavilion to twenty. Where there are only twelve beds in each building, as at the Alexander Hospital, a very large cortege of attendants and nurses is necessary. Thus, for the two hundred and fifty patients contained in this hospital, there is a retinue of one hundred and ninety-eight persons.

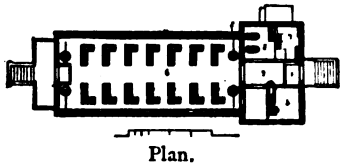
We might still further modify to advantage these isolated pavilions by adding to them a hall where the patients that are well enough and strong enough might take their meals, and which might serve at the same time for a place of recreation and for a reading-room. By this means the more vigorous patients would not be compelled to sojourn all the time in the wards of the sicker ones; and for these isolated pavilions I would propose the model which I here place before you, and which has been designed with great care by a pupil of the service, M. Burais. (See Figs. 6, 7, 8, and 9.)

We might also take as models the double bar-

FIG. 2.

Barracks of the Alexander Hospital.

FIG. 3.



Plan.

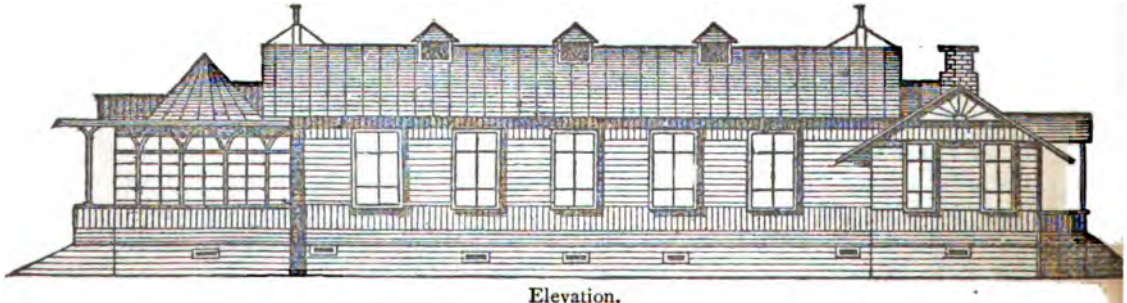
FIG. 4.

Façade.

FIG. 5.

Section.

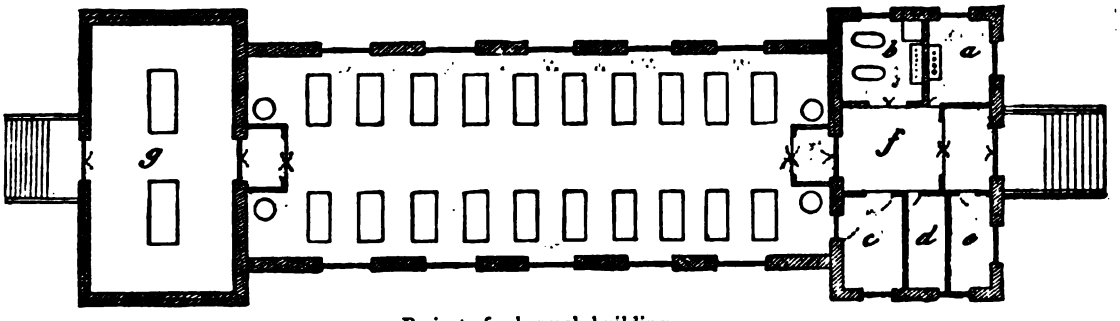
FIG. 6.



Elevation.

racks which serve for convalescent patients at the Alexander Hospital Barracks, the plan of which I have shown you (Fig. 10). A central building, devoted to the general service of the sick, and containing a large hall looking out upon a veranda which serves as a place of recreation and dining-hall for the patients, unites two similarly constructed barracks, in each of which there are fifteen beds.

Fig. 7.



Project of a barrack building.

Fig. 8.

Façade.

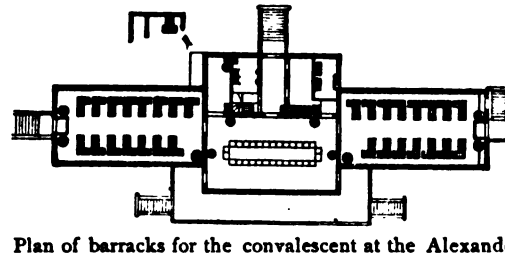
Lastly, there is a mode of hospital isolation little employed at Paris, but of which our neighbors across the Channel make great use. I refer to the floating hospitals. You will find in the work of Lutaud and Hogg a description of two of these floating hospitals situated on the Thames,—the Castalia and the Atlas. To these hospitals on the Thames, we must add that of the port of Tenes. All these floating hospitals result from the refitting of certain old-fashioned ships, which, like that of Tenes, are made over into receptacles for contagious diseases.

Fig. 9.

Section.

Thus far I have been occupied with collective isolation in our hospitals, and with individual isolation. I must now briefly consider the grave question of quarantines and sanitary cordons.

Fig. 10.



Plan of barracks for the convalescent at the Alexander Hospital.

The pestilential diseases, the plague, cholera, yellow fever, all originating in regions far away from France, can only affect the people of our country when they are imported here. Therefore, endeavors have been taken by sanitary boards to prevent the importation of these diseases.

Venice was the first—in 1348—to appoint a sanitary police. Being in continual commercial relations with the East, which was ravaged by incessant epidemics of the plague, Venice was compelled to institute means to oppose the introduction of these epidemics. She first appointed quarantine physicians, intrusted with the inspection of all sailing vessels entering her lagoons, then in 1403 she built a lazaretto, and from this time all cities having commercial dealings with her, made haste to construct similar pest-hospitals.

Many years afterwards, in 1821, the outbreak of the yellow fever in the south of France necessitated special measures, which were embodied in a law passed March 3, 1822. Lastly, the cholera made its appear-

ance in 1830, and from this moment it was mostly for defence against these two diseases, and especially cholera, that international sanitary conferences have been convoked. I must mention particularly those held in Paris in 1852 and 1859, and that of 1865, which was convoked under the inspiration of Fauvel at Constantinople, where was founded, if I may so speak, international hygiene. Quite recently, in 1885, at Rome, the last conference modified in a great measure the system of quarantines.

I must now say a few words about sanitary cordons, lazarets, quarantines, bills of health, and the disinfection of ships.

The name of *sanitary cordons* is given to a series of military outposts organized round a town or tract of country, so as to prevent egress of the inhabitants of a contaminated city, or ingress from a healthy territory. Such measures can only be resorted to in a country thinly settled, and especially where no very extensive commercial interchanges are carried on.

In the East and in Russia these regulations have sometimes been enforced to advantage. But as fast as railroads penetrate a country and commercial relations acquire importance, these sanitary cordons have to be abandoned, as relics of another age. Add, what still increases the causes of abandonment, that the troops themselves which compose this sanitary cordon may be attacked by the epidemic, and be in their turn the cause of the spread of the infectious disease which they are called upon to suppress.

If the sanitary cordons are intended for localities situated in the interior of territories, the lazarets and quarantines, on the other hand, concern our ports and our maritime cities.

From the fact that the diseases which we so much dread come from distant countries, which can have commercial dealings with our country only by the aid of navigation, it is mostly to our ports and sailing vessels that the laws and regulations of the sanitary police apply. The import of these laws is that no ship coming from a region where any pestilential disease prevails (cholera or yellow fever), can enter our ports without being delayed for a while in the waters outside the ports to give time for disinfection and for determining the sanitary condition of the passengers, in order that any infectious disease in the process of incubation might have the time to develop.

It is this time of delay, of variable length, to which has been given the name of quarantine, whatever may be its duration, though this may not be more than twenty-four hours; it enables the sanitary authorities to disinfect the cargo and crew, a procedure which is especially necessary if during the voyage any passengers have died of an infectious disease.

We distinguish two kinds of quarantine,—"quarantines of observation and quarantines of rigor." The latter pertains to the disinfection of the ship, and as, in order to effect this, the vessel must be abandoned by its passengers, these are transported to special places of retreat which are real hospitals of isolation, to which has been given the name of *lazaretto*. Generally these lazarettos are on an island, or they are constituted by pontoons, forming floating lazarets. Their organization leaves much to be desired, and this is true of all countries. These quarantine regulations are vexatious, and very damaging to maritime commerce. They profoundly disturb our commercial relations, and it is easily seen why nations are anxious as far as possible to do away with these restrictions on trade still in vogue at the present day.

No ship coming from a country where any pestilential disease is prevalent can enter our harbors without a bill of health; this bill of health is the ship's passport, and certifies to its sanitary condition from the time it leaves port to the time of entering port. We must distinguish bills of health from the official statement (*arraisonnement*), which is the captain's declaration respecting all the incidents of the voyage which in any way concern the public health.

In view of the numerous difficulties which beset this question of quarantines, attempts have been made to find ways to get rid of these vexatious measures. This subject was discussed with great thoroughness at the last International Conference held in Rome in 1885. Professor Proust, inspector-general of our sanitary services, has proposed to substitute for these quarantines the enforcement of rigorous measures of hygiene and disinfection during the voyage.

In the carrying out of this project, the rôle of ship physician would be a very important one, and a great responsibility would devolve upon him. He would have to decide at what moment and in what manner these measures of disinfection should be put in operation. Hence it is that government has proposed to appoint directly these physicians under its own responsibility.

Communicated to the Congress of Hygiene, held at Havre in 1887, this sanitary project, despite the support which Proust and Brouardel gave to it, has met with very violent opposition among the ship-owners and shipping companies, who profess to see in this direct appointment of a physician by the government an infringement upon their own rights and authority.

But it is to be believed that there will be ultimately agreement on this point, and I think that most hygienists will adopt the conclusions formulated by Proust in the following terms: "Most of the restrictions imposed upon commerce and navigation by the quarantines are but the consequence of want of observance on board the ship of the most elementary hygienic rules; these restrictions will disappear almost entirely the day that the ship managers shall be willing to adopt and carry out rational sanitary measures on shipboard."

As you see, gentlemen, this question of isolation brings up interesting points which I have only touched upon, for in order to do full justice to them, I should have to go over our whole hospital system, and enter into all the details of our sanitary regulations, as well as examine the complex basis of international hygiene.

We have seen in the foregoing lectures how an individual may be preserved from infectious diseases by disinfection and isolation. It remains now to examine another mode of preservation, which consists in creating by inoculations a medium refractory to infectious diseases, and in two following lectures on vaccine and attenuated virus I propose to study with you this other point of prophylactic hygiene.

ON THE SEPARATION OF MOTOR AND TROPHIC NERVES OF MUSCLE.

ALSO A CONTRIBUTION TO OUR KNOWLEDGE OF THE HEAT-REGULATING MECHANISM OF WARM-BLOODED ANIMALS.

By Geo. T. Kemp, Ph.D. (Johns Hopkins).*

Part II.

In the first section of this paper the question of heat-regulation in warm-blooded animals was discussed, and the conclusion was finally reached, that the regulation of heat in such animals depended upon the relation between the production of heat in the tissues and the loss of heat from the body; and each of these factors was then shown to be under the control of the nervous system. Loss of heat is chiefly produced (in man) by vaso-dilatation in the skin, and heat production takes place mostly in the muscles. This production was furthermore shown to depend upon chemical activity of the muscular protoplasm (metabolism), and this metabolism to be directly influenced (not entirely controlled) by the nervous system. We recognized two kinds of nerve-fibres to the muscles,—the sensory and the motor; with a possible third variety,—the trophic.

After excluding the sensory nerves, it was left for this section to decide whether the motor nerves were really trophic in function, or whether an independent set of trophic fibres existed. Experiments have been made to show that cutting a nerve-trunk diminishes the chemical activity of the muscles which the cut nerve supplies. Such experiments clearly do not decide whether the *motor* nerves directly affect metabolism, for motor, some vaso-motor, and other fibres are cut together. Moreover, there seems to be such a clear relationship between the motor and trophic (?) fibres that an anatomical separation can scarcely hope to be effected. It, therefore, occurred to me to try to effect such a separation by minimal doses of curare, and see whether the production of heat went hand in hand with the function of motion. To do this, calorimetric measurements were made of the heat produced by animals under doses of curare just large enough to induce motor paralysis, or, at least, paresis, and then similar observations were made on the same and on different animals, to which much larger doses had been given.

A brief description of the calorimeter and its method of use is all that need be given here. It consists essentially of a metal box, containing water, placed inside a somewhat larger wooden box, and the space between the two packed with saw-dust. Into the metal box, which holds the water, a smaller metal box, with a tight, removable door, is made to go, so as to leave a space of a few inches between its sides and the sides of the water-box.

The animal is placed in the smaller box, which is then put into the larger one, with just enough water to cover it. The smaller box is provided with two pipes, soldered into its top, through which air is forced to supply the animal.

* Associate Director of the Departments of Physiology and Bacteriology, Hoagland Laboratory, Brooklyn, N. Y.

A large metal lid is then put over the two boxes, and the whole thickly covered with wool. The saw-dust prevents the loss of heat from the sides and bottom, and the wool from the top. A thermometer is let down into the water through a hole in the lid. By the proper methods it is then determined how many heat-units it takes to raise the water in the calorimeter one degree. This is the calorimetric equivalent, and, of course, varies with each calorimeter. When the dog is put into the box, and allowed to remain there for some time, the temperature of the water rises, being heated by the body of the dog. To find the amount of heat dissipated from the dog's body in a given time, we have only to find the number of degrees which the water has risen, and multiply this by the calorimetric equivalent. For example, if the calorimetric equivalent is 100, and the water has risen two degrees, the amount of heat dissipated is clearly 200, for the calorimetric equivalent is the number of heat-units required to raise the water one degree. To find the amount of heat produced, the temperature of the dog is taken before entering and after leaving the calorimeter. If the dog's temperature has risen, then the dog must have produced not only heat enough to raise the water of the calorimeter so many degrees, but also the heat required to raise his own temperature. This latter amount is found by multiplying the specific heat of the dog by his rise in temperature, and this, when added to the heat recorded by the calorimeter, gives us the total heat produced. If his temperature falls, the heat-units represented by the fall are calculated in a similar manner, and the result is subtracted from the amount of heat given to the calorimeter; for the amount subtracted clearly came from a cooling of the dog's body, and represents heat stored up there before he went into the box. The work was done at the Physiological Laboratory of the University of Pennsylvania, and the calorimeter employed was the one used by Professor H. C. Wood in his well-known research on fever.*

For a full description of this apparatus the reader is referred to that memoir. Fahrenheit thermometers were used, and English heat-units adopted, for the reason that the calorimetric equivalent had already been calculated in these terms and not in calories, for readings of the Centigrade thermometer. The thermometers were graduated to $\frac{1}{10}$° F., and the readings could easily be estimated to $\frac{1}{20}$°. The thermometers were carefully compared with a standard just before beginning the work, and the corrected readings are given in every instance.

In order to avoid the thermic disturbances incident to the use of chloroform or ether, the dogs were tracheotomized under an anæsthetic the day before the curare was given. The muscles were separated so as to afford ready access to the carotid artery, care being taken not to disturb its sheath, thus avoiding thrombosis in the artery or irritation of the vagus. The whole operation was performed antiseptically and the wound dressed with iodoform. The next day the wounds were found devoid of inflammation and the dogs in good condition. After giving curare, the stitches were cut, and, without further operating, the carotid could be found, and separated from the vagus for connection with the kymograph. Ordinary surgical tracheotomy canulas of large size were used, so that the inside tube could readily be removed and cleansed of mucus. The artificial respiration was kept up sometimes by a bellows driven by an engine, and at others by a large rubber gas-bag under pressure. This bag was connected by a T-tube with a Bunsen pump, which constantly forced air into it, and also with the dog, a cut-off being placed in this path, which allowed the air to pass at regular intervals to the dog. The engine and bellows were always used when the dog was in the calorimeter. The air to the dog was forced through a Woulff's bottle containing some water, in order to avoid the great thirst and consequent disturbances from pain which always follow long-continued artificial respiration with dry air.† The simple tying down of a dog is nearly always followed by a considerable fall in temperature. An experiment with curare was never begun until such fluctuations of temperature had disappeared, although a delay of several hours was often necessitated. An ordinary calorimetric experiment was then conducted as follows: The dog's rectal temperature was taken while he was held by an assistant, without being

* "Fever: A Study in Morbid and Normal Physiology" (*Smithsonian Contributions to Knowledge*, No. 357).

† The same bottle and water were always used when the dog was put into the calorimeter without curare. The same difference between the temperature of the water in the calorimeter and the temperature of the air in the room was carefully maintained, so that the error, from condensation of moisture in the calorimeter, was the same in each case.

tied down. He was then put into the calorimeter, without giving him curare, and the artificial-respiration apparatus, which was later to supply him directly with air, was made to keep up the ventilation of the calorimeter-box. At the end of an hour he was taken out, and his temperature taken without tying him down. He was then allowed to run around the room for an hour or more, after which he was tied down, and remained so until his temperature neither rose nor fell, as shown by a thermometer remaining in his rectum.

With a sharp knife the jugular vein was then laid bare and a canula inserted. This can often be done without even a kick on the part of the dog. Curare was next injected, and the temperature record taken every minute or two until respiration stopped (from about two to ten minutes).

The artificial-respiration apparatus was then connected with the dog, and his temperature taken every few minutes until the proper time to put him into the box, which varied with the observation to be made.

In the first section of this paper* it was shown that the vaso-motor system had much to do with the distribution of heat through the body, and in man was one of the chief means by which the body rid itself of an excess of heat. It was, therefore, very necessary to understand clearly the effect of curare on the heart and vaso-motor system, in order to eliminate any errors which might be introduced through these media. Numerous observations were made with doses of curare, varying from those which were just sufficient to paralyze the motor nerves of striped muscles, to large doses, which nearly reduced the blood-pressure to *nil*. If it were practicable to publish all the curves obtained in this study they would speak for themselves, but as this, of course, is out of the question, I shall simply state as briefly as possible the results of my observations, referring to only two of the curves which were taken.† Small doses of curare may or may not lower the general arterial tension, the resistance of the dog to curare varying greatly with the individual. Small doses often show a weakening of the respiratory undulations on the blood-pressure curve, due to a paresis of the respiratory muscles. A slightly increased dose will cause the respirations to become very feeble or to stop altogether, and the pressure-curve rises, owing to asphyxia. That the rise is really due to asphyxia is shown by the fall of the curve the moment that artificial respiration is started. All this while the heart and vaso-motors are often totally unaffected. A larger dose will cause the curve to fall, the action being principally on the heart. The heart-beats are greatly diminished in power, this effect being often seen before the respirations are entirely stopped by the drug. The vaso-motors are still unaffected to any appreciable extent, for stopping the artificial respiration causes an immediate and decided rise in the curve, followed by the development of Traube curves.‡

After larger doses of curare, stopping artificial respiration will cause the pressure to rise, and Traube curves to appear; but the rise is less marked, the heart-beats very much more feeble, and the fall from exhaustion comes much sooner than with smaller doses. The rise is undoubtedly due to vaso-constriction, for the heart-beats are not increased sufficiently to account for it, and furthermore the Traube curves show that the vaso-motors are still functional.

The effect of curare on the *bodily temperature* has been studied by various observers with different results. Tscheschichin§ found that the temperature fell from the time of injection until the first convulsion, and then rose. He attributed the rise to the muscles, not by virtue of the twitches and jerks which they exhibit, but by an increased heat-production in them.‖ Falk¶ found that the tem-

* Page 86.

† See curve 3, at end of article, and explanation of curves on pages 162 et seq.

‡ Plate III. Traube curves are the prominent long undulations in the blood-pressure curve which are seen in curarized animals. They cannot be due to changes in thoracic pressure, as are the ordinary respiratory waves, for the muscles of the thorax and of the diaphragm are completely paralyzed. They are explained as follows: Curare, in moderate doses, acts only on the nerves to striped muscles. The respiratory centre in the medulla, not being affected by the drug, continues to discharge, but its nervous impulses, on their way to the muscles of the thorax and diaphragm, are blocked by the palsied nerves. The vaso-motor centre in the medulla discharges sympathetically with the respiratory centre, and, as the curare does not paralyze the vaso-motor nerves (they being to unstriped muscle) as readily as those to the voluntary muscles of respiration, the vaso-motor impulses generated in the medullary reach their peripheral termination in the arterioles and cause a constriction.

§ *Arch. f. Anat. u. Physiol.*, 1866, p. 160.

‖ "Leichte Zuckungen haben übrigens gar keinen Einfluss auf die Temperaturerhöhung, . . . so muss man die Temperaturerhöhung während der Krämpfe als Folge der gesteigerten Wärmeproduction in den im erhöhten Thätigkeitszustande befindlichen Muskeln."

¶ *Pflüger's Arch.*, vol. xxv. p. 590.

perature sank for the first five minutes, then rose to the normal (or generally above), and then fell rapidly, shortly before death. Fleischer* gets no fall before the rise, and thinks the convulsions have nothing to do with the rise. Riegel† attributes the fall which follows the administration of curare to a diminished metabolism.

Voisin and Liouville,‡ as early as 1866, relate clinical observations with curare in which the drug was pushed, even to partial paralysis, with most interesting results. They found that after hypodermic injections of curare there resulted fever with chill, followed by sweating, with profound nervous disturbances, such as general muscular twitching, difficulty in swallowing, facial contortions, incoördination of movements of the eyes and of the limbs, and even paralysis of voluntary motion in the limbs. The temperature in some cases rose to 40.4° C. (= 102.7° F.). Voisin and Liouville think that the phenomena here observed (including the rise of temperature) are to be attributed to increased sensibility of the nerves, thus agreeing with Claude Bernard, whom they quote as follows:§ "Lorsque les propriétés vitales d'un nerf sensatif ou moteur vont disparaître sous l'influence d'une perturbation quelconque elles s'exaltent d'abord pendant un certain temps, il se produit une surexcitation plus ou moins forte qui chez les lapins soumis à l'influence du curare se traduit par des legers frissonnements dans les muscles peauciers."

In my experiments I find that small doses of curare cause an immediate rise in the rectal temperature, the extent and duration of which depend upon the dose and the temperature of the surroundings. Large doses cause a slight transient rise, followed by a steady fall, the rapidity of which depends somewhat upon the dose, but especially upon the temperature of the surroundings.

The rise in temperature I would explain by an increased sensibility of the nerves, stimulating metabolism in the muscles. The fall I believe to be due chiefly to diminished heat-production, as I hope to show after a discussion of the results of my calorimetric observations. A detailed account of the complete series of my experiments would involve all the figures incident to the calculation of thirty-seven calorimetric observations, besides long lists of temperature-readings which it would be impossible to give in anything short of an extensive monograph. I have, therefore, condensed the work into a table, in which the results of the experiments are given *seriatim*. Whenever there is anything in connection with an experiment which would affect the result, it will be found in the column of remarks.

EXPLANATION OF TABLE.‖

Columns B and Q give the dose of curare administered, B giving the total amount of the dose, and Q the amount of curare per pound of dog. The figures in Q are directly comparable.

C and D give an idea of the rapidity with which the curare took effect.

E and F show the changes in rectal temperature of the dog under different doses of curare.

I and J show the rectal temperature on entering and on leaving the calorimeter respectively.

K is the difference between I and J, and offers a ready means of comparing the relative power of dogs to maintain their temperature before receiving curare, and after different doses of that drug.

L is the total heat dissipated, given in English heat-units, for one hour. M is the hourly heat-production in the same terms. N is the difference between L and M. O shows the effect of curare on heat-dissipation, and P on heat-production. R shows the amount of heat produced per pound of dog. The figures in this column are directly comparable, and are arranged conveniently for showing the effect of curare in large and small doses upon the heat-production of the dog as compared with the normal.

In glancing over column K it will be seen that there is a tendency for the temperature of the dog to fall while in the calorimeter, even when no curare had been given. The variations under curare are much more frequent and much greater than in the normal dog, showing that curare causes a disturbance of the heat-regulating system more or less profound. In looking at column K more carefully, it will be seen that in every case where the temperature of the dog rises, the dose of curare is small (at least less than one milligramme ($\frac{1}{64}$ gr.) per pound, as seen in column Q), while a larger dose of curare (2.84 and over, in column Q) invariably causes a con-

* *Pflüger's Arch.*, vol. ii., 1869, pp. 433–444.

† *Centralbl. f. d. Med. Wiss.*, 1871, p. 403.

‡ *Gaz. des Hôpitaux*, 1866.

§ Op. cit., p. 443.

‖ See end of this article.

siderable fall. It has already been shown that curare in large doses lowers the blood-pressure, and it might be urged that the loss of temperature was due to an increased heat-dissipation, such as follows section of the cord. That this is not the case becomes evident from a comparison of columns P and O. In nearly every case in which the number in P has the negative sign, and its value is considerable, the corresponding number in O will be found to have the negative sign also, but to be less in value than F. This shows that heat-production (column P) is more influenced by curare than heat-dissipation (column O), the heat-dissipation being even less than in the normal dog. This fact is suggestive, for we have seen that curare causes a fall of blood-pressure, but does not paralyze the vaso-motor nerves,* and it would seem that when the heat-production is greatly lowered, the vaso-motor nerves so control the supply of blood to the skin as to allow as little heat-dissipation as possible. The effect of decidedly large doses on heat-*production* is readily seen by comparing the columns Q and R, for example. Where the dose in Q is 3.75, we have the hourly heat-production reduced from 4.8 to .7 per pound of dog, or from 76.04 to 11.08 for the whole dog, and it will be seen that, without exception, a large dose of curare in Q always has a corresponding number in R, which is less than the number for the dose .00 of curare. The same thing is shown in column R, in those experiments in which three observations were made in one day. The effect of the first dose may be either to increase or diminish the heat produced, but after the second dose it is invariably smaller than the normal, the difference being generally very striking.

Experiment 0.—This was one of the first made, and the dose of curare was not recorded. The curare was injected subcutaneously and in considerable quantity, for the minimal dose of curare had not been found when this experiment was made. The heat-regulating mechanism was disturbed to an enormous degree, for there was an increase in the amount of heat dissipated, and not only was there no compensatory rise in the amount of heat produced, but, on the contrary, the nerves regulating heat-production were so completely paralyzed that the heat produced fell 51.36 below the normal. On the other hand, heat was given off freely from the dog despite the diminished production, and both heat-production and heat-dissipation worked together to lower the rectal temperature.

March 26.—The dog received 60 milligrammes of curare (3.75 milligrammes per pound) subcutaneously. The heat-production fell from 76.04 to 11.08. The heat-dissipation was only diminished from 100.40 to 90.28.

March 31.—Large dose of curare (4.55 milligrammes per pound) subcutaneously. Heat-production fell 29.63; heat-dissipation, 16.33.

April 2.—Large dose of curare to same dog, which had recovered from last experiment. The dose given was the same as in March 31. Heat-production fell 57.08; heat-dissipation, 23.18.

April 15.—Moderate dose (1.42 milligrammes per pound) injected into the jugular. The effect was very marked. Heat-production fell 99.78; heat-dissipation, 45.14.

May 5.—Small dose (.85 milligramme per pound). The heat-production and heat-dissipation are each increased. The heat-dissipation is increased slightly more than the heat-production. This may be explained as an effort of the vaso-motor system to get rid of an excess of heat produced by the stimulating effect of a *small* dose of curare, or it may be regarded as an effort of the metabolic nerves to produce more heat to compensate for the increased dissipation. The difference is so small that the experiment may well be regarded as one in which the animal is practically normal except for the loss of power of motion.

May 9.—Small dose (.67 milligramme per pound), causing a decided rise in the amount of heat produced. Here the rise cannot have been produced by thermotaxic influences tending to compensate for increased heat-dissipation, for the dissipation was slightly less than in the normal dog. We are forced, therefore, to regard the increased heat-production as a direct result of a stimulation of the metabolism by the small dose of curare, and this, indeed, by its action on the nerves.† The fact that the power of motion returned to the dog while in the calorimeter may partially account for the largeness of the increase in heat-production in this experiment, but this is in common with several other experiments, and will be discussed separately.

* Page 157.

† Compare Colosanti, *Pflüger's Arch.*, 1878, vol. xvi. pp. 157–172. Referred to in the first division of thi paper, p. 88.

May 10.—In this experiment two doses were given to the same dog, first a small one (.68 milligramme per pound), and afterwards a large one (2.84 milligramme). The same remarks apply here, for the small dose, that were made for the experiment of May 9. The heat-dissipation remained absolutely the same as in the normal dog, while the heat-production was increased 20.66. After the larger dose the characteristic phenomena of poisoning from full doses of curare were exhibited. The heat-production was diminished 82.32, while the heat-dissipation was only diminished 19.52. The numbers in column R are very striking in this experiment. They are 6.2 normal, 7.3 small dose, 1.8 large dose.

May 12.—(Small dose, 1.00 milligramme per pound.) Heat-production and heat-dissipation both increased almost exactly to the same extent.

May 18.—Small dose (.86 milligramme per pound), followed by a decided fall in heat-production. Here we have an apparent exception to the rule observed in the previous experiments, but a closer examination of the experiment shows that it is what we should expect. We suppose small doses of curare to increase the metabolism in muscle, through the nerves by rendering them hypersensitive, which by no means destroys their thermo-*regulating* function, however that may be performed. Now, in the present case, for some reason not apparent, the heat-dissipation fell from 254.98 to 198.60; and, if the same amount of heat had been produced as in the normal dog, we should have had the temperature raised to 105.4°, which would have shown an embarrassment of the thermotaxic system not generally produced by small doses of curare. This experiment, then, is quite in accord with the others, and shows that the nerves had not lost control of heat-regulation.

May 19.—Moderate dose (1.43 milligrammes per pound). Heat-production diminished only 4.14. The disturbance of the heat-regulators was greater than this, however, as there was an increase in the heat-dissipation, and had the thermogenic nerves been fully functional there should have been an increase in heat-production to compensate for this extra loss.

June 9.—Small dose (.40 milligramme per pound). The record of this experiment is rather peculiar. The dog came under the influence completely in eleven minutes, and his temperature rose with astonishing rapidity until it reached 105°, a gain of 2.4° F. in one hour and twenty-five minutes. The dog was then put into the calorimeter, in which his rectal temperature fell 3.4° in one hour, and the experiment gave results precisely like those in which large doses of curare had been given.

June 10.—In this experiment two doses were given to the same dog. The first one small (.46 milligramme per pound), the second larger (1.09 milligrammes), making in all 1.54 milligrammes. The small dose caused an increase in heat-production (5.8 per pound over 5.6 in the normal dog), but not sufficient to meet the increase in heat-dissipation, showing that the heat-regulating mechanism was embarrassed. The larger dose caused a diminution in heat-production of 78.86, and in heat-dissipation of 66.96. The figures in column R of this experiment are instructive.

June 21.—In this experiment, again, the dog received two doses,—first, a small dose (.27 milligramme per pound), and then a larger one (.92 milligramme per pound), making 1.19 milligrammes per pound in all. Here, as in the experiment of June 9, we have a prompt absorption of the curare, a rapid rise of temperature to 104.8° (a rise of 1.35° F. in thirty-four minutes), and a subsequent fall in heat-production, with a considerably smaller fall in dissipation, just such as usually results from larger doses of curare. The second dose of curare was not large, and, strange to say, appeared to act as a stimulant to heat-production,—the heat-production per pound falling from 6.1 to 4.0 under the small dose, and then rising to 4.8 under the second small dose.

June 23.—Dog received two doses,—the first, .24 milligramme per pound; the second, 3.00 milligrammes per pound. The small dose, as in the two previous experiments, gave results identical with those produced by larger doses earlier in the series of experiments, although not so marked. The heat-production fell 26.68, while the fall of the heat-dissipation was 20.74. The larger dose produced the characteristic effect, the heat-production falling 69.25, and the heat-dissipation 56.12. It will be observed in all the experiments made in June that a smaller dose of curare had far more paralyzing action than earlier in the spring. It is interesting at least to note the observation, although no explanation is apparent.

As far as we have now proceeded in a discussion of these experiments, we have corroborated the testimony of the observers quoted in the first section of this paper, in

finding that curare lowers metabolism. We have accomplished this by methods not hitherto employed for research in this particular field. We agree with Tscheschichin that the muscles are the seat of increased heat-production in effecting the rise of temperature caused by curare, and agree with Bernard and Voisin and Liouville that this is probably due to increased sensibility of the nerves, but the question still remains unanswered,—Are the nerves in question the ordinary motor nerves to muscle, or is there a special set of trophic fibres? In glancing over column R it will be seen that the only cases in which the heat-production is increased above the normal are those in which the dose of curare is small, and in the column of Remarks it will be found that in every such case there were evidences of motor power, such as twitchings of the muscles, or, in some cases, even a regaining of the power of respiration and voluntary movement. The reason for this is that, in seeking a dose with which to paralyze the motor nerves and leave all others intact, we have to use such small quantities of curare that the paralysis is not perfectly maintained for an hour. Of course, a hard-and-fast proof that there are two sets of nerves cannot be given until one can be completely thrown out and the other left perfectly functional, but in the present instance, I hope to show that there are sufficient grounds for believing that in a very high degree of probability there is a set of trophic nerves separate from the motor, although the two are probably closely related. That the increased heat-production which follows the administration of small doses of curare is not due to heat generated in the muscles by their twitching is shown by such experiments as that of March 31. Here the dog was given a large dose of curare (4.55 milligrammes), and was observed continuously for seven hours thereafter, when the first signs of returning motion made themselves manifest by the characteristic twitchings. The dog was then put into the calorimeter, and when taken out twitches and strong jerks occurred, but no co-ordinated movements. The results of the experiment are those of a typical calorimetric experiment after large doses of curare, and do not resemble at all the results of minimal doses. In the experiment of May 5 the dog was given .85 milligramme of curare per pound, and, after waiting nearly two hours, was put into the calorimeter just when the twitchings were beginning to appear. In both these cases the twitchings were going on all the time that the dog was in the calorimeter, and yet they made no appreciable impression on the result. In all the experiments except the two just mentioned the dog was completely paralyzed on entering the box, and from observations on animals under curare out of the calorimeter, we know that the dog must have been completely paralyzed the greater part of the time he was in the calorimeter. It, furthermore, seems by no means probable that a dog with such a strong paresis that he could only give an occasional twitch or jerk, should be able to call his palsied nerves into such activity as to give greater metabolism under those circumstances than in the normal condition; and, on the other hand, on comparing the results in the different experiments in which the heat-production was increased under small doses of curare, we find, even when the dog had sufficiently recovered in the calorimeter to breathe and walk, there was little or no difference in the increase of heat-production over cases where simple twitchings were seen. Compare May 12 with May 9 and 10. Another observation to the point is, that in all the June experiments, in which small doses of curare were given (with one exception), the characteristic twitchings were seen, and yet in some cases there was a fall in heat-production greater than in others where the motor paralysis had been complete from beginning to end. Surely this would not have been the case if it could be argued from the presence of twitches and jerks that the motor nerves retained their control over heat-production, and, if the twitchings are due to an increased sensibility of the motor fibres, it is still more absurd to suppose that they would be more active in the performance of one function (motion), and less active in the performance of another (heat-production). We may then regard it as demonstrated that minimal doses of curare produce a strong paresis of the motor nerves without thereby lowering heat-production; hence it may be inferred that *the motor nerves are not the nerves which control the metabolism in muscle by which heat-regulation is maintained.*

In most cases doses of curare which are just sufficient to paralyze the motor nerves cause a rise in bodily temperature, which the calorimeter shows to be due to an actual increase in heat produced. Larger doses invariably cause an enormous fall in heat-production. Now this is directly in accord with the law of Claude Bernard, previously

stated,* that drugs which paralyze any set of nerves first produce a condition of increased sensibility of these nerves; therefore we may say that curare paralyzes both motor and trophic nerves, the motor nerves being, as a rule, more susceptible to its action. Very small doses of curare produce an increased sensibility of both motor and trophic nerves. This is well shown in the experiments of Voisin and Liouville already given. A slightly larger dose is sufficient to paralyze the motor nerves, leaving the trophic nerves still in their hypersensitive condition. A large dose paralyzes both motor and trophic nerves. Besides the evidence here adduced there are certain pathological conditions which strongly suggest that the motor and trophic nerves are separate, though probably closely related. In the peculiar disorder known as Charcot's disease, swelling and erosion of the joints occur, together with degenerative changes in the muscles, following lesions of the anterior cornua of the spinal cord. In progressive locomotor ataxia these arthritic lesions have also been found associated with degeneration in muscle.

After a careful examination of the cord in these cases, Charcot† found that the anterior cornu of the cord was involved, and always the anterior cornu on the side of the arthritic lesions. In some cases the trouble in the joints was well advanced before the motor power of the muscles was lost, so that the objection of disuse may be laid aside.‡ As the motor nerves to the joints are out of the question, we are forced to conclude that there are separate trophic fibres which have their origin in the anterior cornu along with the motor nerves, and which are, therefore, probably in close relationship with them.

SUMMARY.

The results of the experiments on the influence of curare on the vaso-motor system, with references to curves, will be found on pages 163 to 165.

Curare produces more or less profound disturbance of bodily temperature in warm-blooded animals.

The injection of small doses is followed by a rise in bodily temperature.

After the injection of large doses the bodily temperature falls. This fall is preceded, however, by a rise more or less transient.

The rise from the small dose is brought about by an actual increase in the heat-production of the body.

The fall, while sometimes aided by vaso-motor phenomena which cause increased heat-dissipation, is regularly due to a lessening of the amount of heat produced.

The motor nerves are not the nerves by which the thermotaxic nervous mechanism effects a greater metabolism in the muscles, with the consequent increase in the production of heat.

Such heat-regulation is wrought through nerves distinct from the motor, though probably closely related to them.

EXPLANATION OF PLATE III.

Upper Curve.—Dog had been put under ether for tracheotomy, and exposure of the jugular vein for injection of curare, and had then been allowed to come from under the ether while still tied down. 8.5 milligrammes of curare were next given, and it required eighteen minutes for all reflexes to disappear. This is a very small dose, but was sufficient to produce complete muscular paralysis. Upon shutting off artificial respiration, marked by x on the curve, both pressure and heart-beat were affected in a most beautifully rhythmical manner. A large dose of curare given just after, and not shown in curve, produced the typical fall in pressure and weakening of the heart-beat. The peculiar character of the curve just after the stoppage of artificial respiration strongly suggests a hypersensitive condition of both vaso-motor and cardio-inhibitory nerves or centres. We have the strong heart-beat on the descending limb, and the quickening of the heart-beat on the ascending limb; in short, we have a greatly exaggerated condition of what occurs normally, though not a twitch was observed in either thoracic muscles or diaphragm. It is interesting to note that several curves almost exactly like the one given, were obtained from the same dog before muscular movement ceased, but while the respiration was embarrassed.

Lower Curve.—This is a continuation of the upper curve, the distance from base line being true for each, and was taken somewhat later. The dog, in the meanwhile, had received two hundred and four milligrammes of curare. Upon shutting off arti-

* Page 158.

† "Leçons sur les Maladies du Système Nerveux." Paris, 1884, p. 121.

‡ Charcot's discussion of the whole subject is most masterly, and references to literature are given, so that for a fuller discussion of the subject the reader is referred to that author. Op. cit.

ficial respiration the pressure rose and Traube curves appeared, but they were nothing like as large as in the preceding curve. A continuation of the curve showed also that vaso-motor exhaustion soon came on, and the pressure fell. The heart-beats, though stronger, are not so much affected as in the upper curve, thus showing that the cardio-inhibitory nerves are affected as well as the vaso motors, when large doses of curare are given.

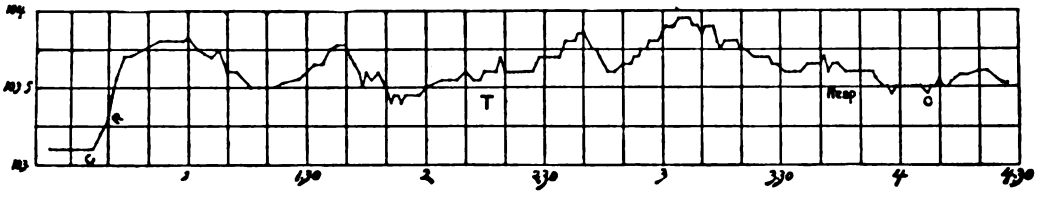
EXPLANATION OF PLATE I.

Ordinates, temperature; each four lines = 1° F.

Abscissas, time; each line = ten minutes.

This curve was taken from the dog in the experiment of June 23.

PLATE I.



12.20. Temperature of room, 81°.

12.35 C. Curare injected, eight milligrammes,—.52 milligramme per pound.

12.39 R. Orbital reflex just disappeared.

2.15 T. Twitchings in abdominal muscles, being first signs of returning motion.

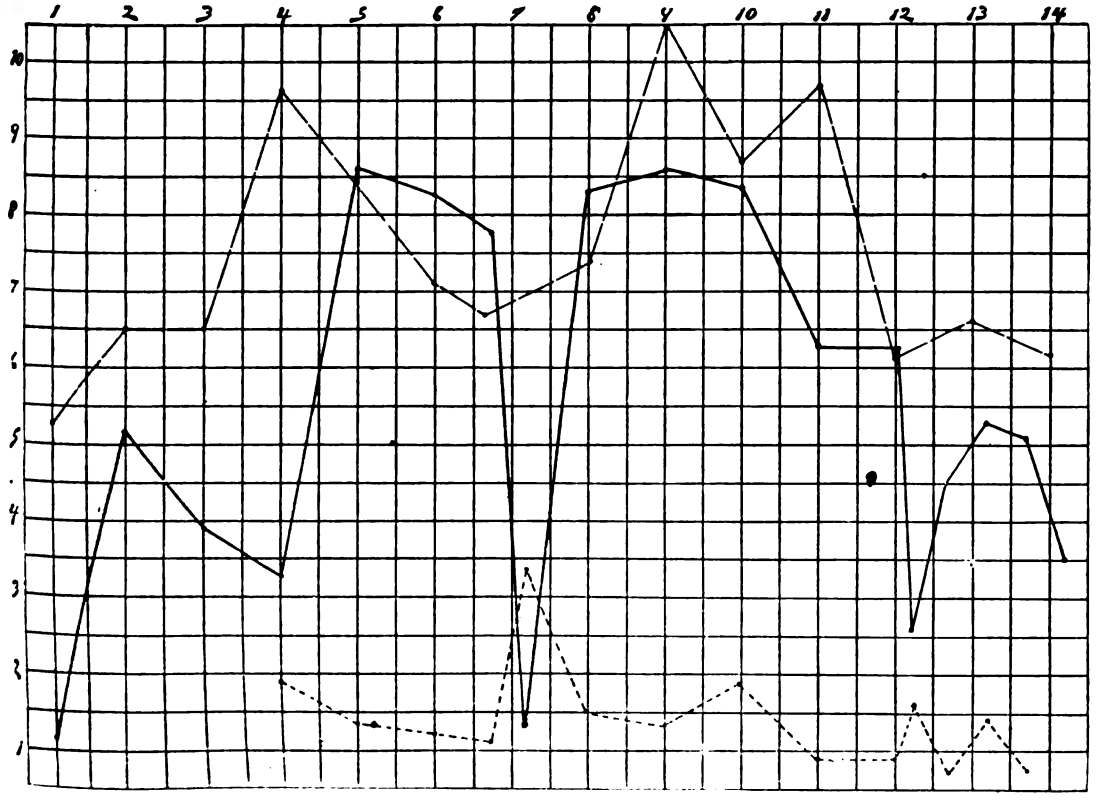
3.43. Slight signs of natural respiration.

3.55. Respiration strong.

4.06 c. Curare again injected, .24 milligramme per pound.

It will be seen that there is a decided rise in the curve after the injection of curare. The curve shows admirably what a peculiar influence small doses of curare have on bodily temperature. This rise of temperature from curare is what is always observed, and takes place even when there is a subsequent fall. It was not deemed necessary to give other curves, as this one is essentially a type of those obtained in all the experiments.

PLATE II.



EXPLANATION OF PLATE II.

This plate is intended to give a bird's-eye view of those experiments in which the effects of large and small doses of curare are compared.

The values are all in terms of ordinates, the abscissas representing the different experiments.

The upper curve ———— represents the number of heat-units produced per hour, per pound of dog, when no curare was given.

The curve marked ---------- represents the dose of curare in milligrammes per pound of dog. This curve is only given in those experiments in which curare was administered in the same way,—*i.e.*, by direct injection into the jugular, the results being thus comparable.

The curve ———— represents the number of heat-units produced per hour, per pound of dog, after giving the dose of curare indicated by the dotted curve.

When the curve ———— rises above the one represented by the line ————, it shows that the actual heat-production, after giving curare, was greater than in the normal dog. In every such case the dose of curare was between .4 and 1 milligramme per pound of dog, which was about the dose found to produce paralysis or strong paresis, and at the same time stimulate metabolism. When the dose is increased above one milligramme per pound of dog, there is a marked fall in the curve ————, showing that heat-production (metabolism) has been markedly affected. This is especially shown in Experiment 7, where two doses were given in one day, the smaller dose—6.2 milligrammes—kept the curve ———— considerably above the curve ————, while a great increase in the dose of curare almost lowered the heat production to *nil.*

ADDENDUM.

My attention has lately been called to an article by Mosso,* which appeared not long since in *Virchow's Archiv*, and which I should have been glad to mention had I noticed it sooner. My paper was in the printer's hands when I read Mosso's article, but of such interest is it in connection with the subject in hand that I add this brief notice of it as an addendum.

In working with curare on both frogs and dogs, Mosso obtained the characteristic rise in temperature which I have figured in Plate I, and adds another observation of exceeding interest, that, after giving strychnine, the rise is more prominent than before. He finds, also, that when a dog has received sufficient curare to paralyze his motor nerves, and even when his temperature has been lowered, a dose of strychnine will cause his temperature to rise again.† This would appear to conflict with the conclusions which I have drawn from my work, but he adds‡ that when the dose of curare is large this rise will not take place, which shows that his observations and mine are confirmatory of each other, for when the rise did take place he evidently had struck the proper dose of curare to paralyze the motor but not the trophic nerves.

In addition to this, he has shown that the temperature-curve of an animal does not run parallel to the curve of work done by its muscles; and the drift of his whole work is towards the same conclusions that I have given at the end of my paper,—viz., that the motor nerves are not those which govern heat-production. His work embraced a more widely-extended study than mine into different fields, such as the effect of psychic phenomena, pain, etc., on the bodily temperature; but it lacked one essential point, which my work has supplied,—viz., calorimetric observations. Mosso took the variations in bodily temperature as his guide, without showing conclusively what produced them. I have *shown* that these variations are, for the most part, actually due to what he *attributes* them,—viz., variations in heat-*production.* The two researches are, therefore, concerning this point, reciprocally confirmatory and supplemental.

* "Einfluss des Nervensystems auf die thierische Temperature." *Virchow's Arch*, vol. cvi. pp. 80–126.

† Op. cit., p. 98.

‡ Op. cit., p. 114.

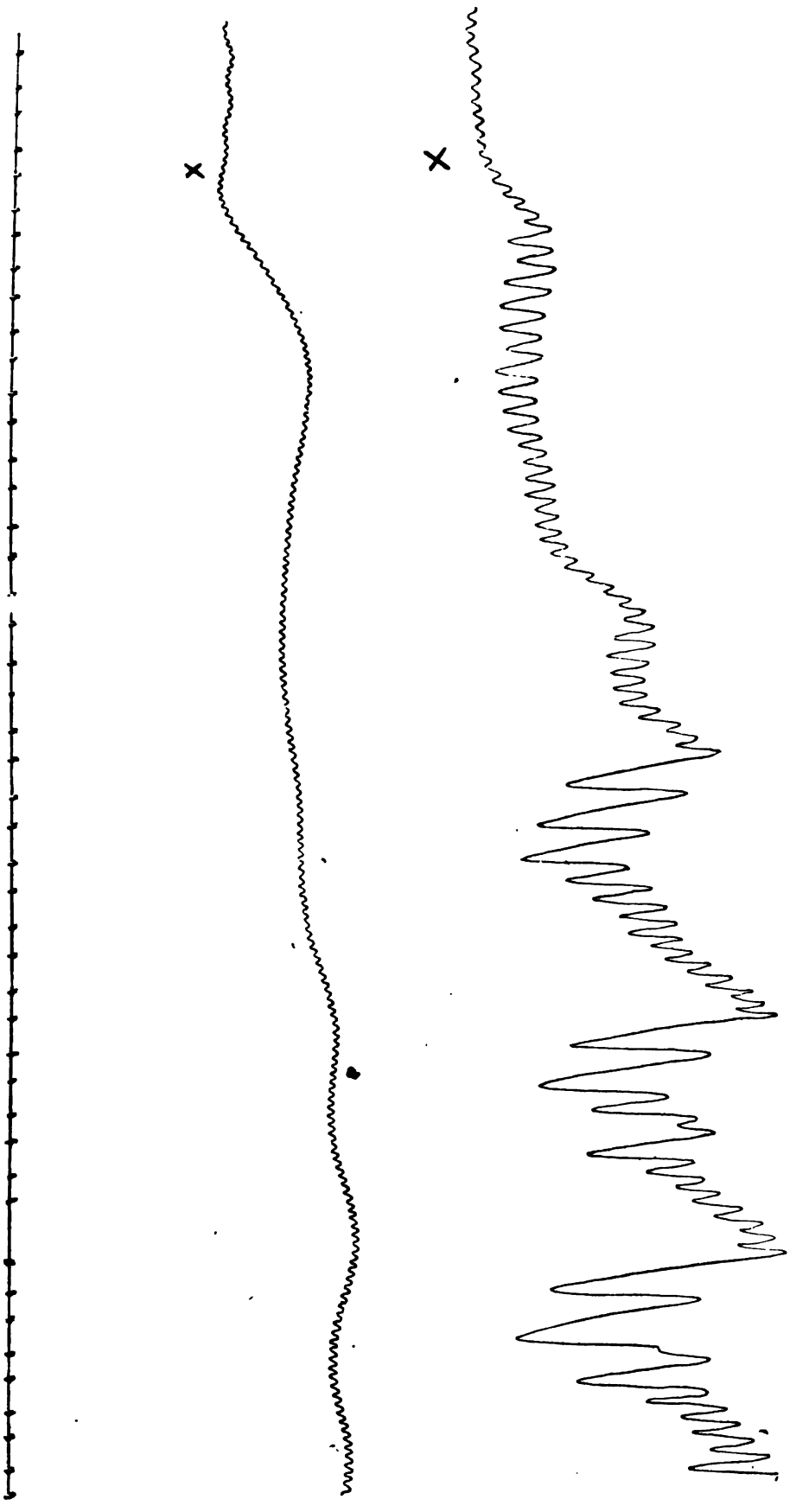


PLATE III.

Reference number.	Date of experiment.	A. Weight of dog (pounds).	B. Dose of curare in milligrammes.	C. Time after injection of curare that respiration stopped.	D. Time after injection of curare that orbital reflex disappeared.	E. Temperature of dog before injecting curare.	F. Gain (+) or loss (—) of dog's temperature between injecting curare and entering calorimeter.	G. Temperature of room.	H. Time after injecting curare that dog entered calorimeter.	I. Temperature of dog entering calorimeter.	J. Temperature of dog leaving calorimeter.	K. Gain (+) or loss (—) of dog's rectal temperature in calorimeter.	L. Total heat-dissipation per hour.	M. Total heat-production per hour.	N. Excess (+) or deficiency (—) of heat produced as compared with heat dissipated.	O. Difference in heat dissipated before and after curare.	P. Difference in heat produced before and after curare.	Q. Dose of curare in milligrammes per pound of dog.	R. Heat produced per pound of dog.	Remarks.
0	.....	22	∞	.....	.....	.....	.....	63°	.....	104 60°	104.50°	— .10°	176.90	175.25	— 1.65	.....	.....	∞	7.8	
.....	.....	22	.....	.....	.....	.....	.....	66°	25 minutes.	99.70°	95.20°	— 4.50°	197.64	123.39	— 74.25	+ 20.74	— 51.36	.....	5.6	
.....	.....	22	.....	.....	.....	.....	.....	68°	.....	95.20°	95.40°	+ .20°	97.60	100.90	+ 3.30	— 74.35	— 79 30	.....	4.6	
1	March 26.	16	∞	.....	.....	.....	.....	65°	.....	102.50°	100.50°	— 2.00°	100 40	76.04	— 24.36	.....	.....	.....	4.8	
.....	March 26.	16	60[1]	5 minutes.	30 min.	100.50°	— 2.00	66°	45 minutes.	98.50°	91.90°	— 6.60°	90.28	11.08	— 79.20	— 10.12	— 64.96	3.75	.7	Dog perfectly paralyzed throughout the experiment.
2	March 31.	22	∞	.....	.....	.....	.....	64°	.....	103.00°	102.60°	— .40°	139.08	132.48	— 6.6	.....	.....	∞	6.0	
.....	March 31.	22	100[2]	11 minutes.	16 min.	102.[illegible]°	.....	67°	7 hr. 6 min.	102.90°	101.60°	— 1.30°	102.75	102.95	— 19.8	— 16.33	— 29.63	4.55	4.7	Twitchings of muscles on entering, stronger twitches and jerks on leaving, calorimeter; no co-ordinated movements.
3	April 2.	22.5	100[3]	9 minutes.	10 min.	102.70°	— 1.4	70°	6 hr. 47 min.	101.30°	98.90°	— 2.40°	115.90	75.40	— 40.5	— 23.18[4]	— 57.08[4]	4.55	3.4	
4	April 15.	15.5	∞	.....	.....	.....	.....	71°	.....	102.70°	102 40°	— .30°	146.40	142.91	— 3.49	.....	.....	∞	9.2	
.....	April 15.	15.5	22[5]	Few seconds.	1 min.	100.30°	— 2.7	72°	1 hr. 40 min.	{ 97.60°[6] 96.10° }	91.10°	— .50°	101.26	43.13	— 58 13	— 45.14	— 99 78	1.42	2.8	
5	May 5.	16.5	∞	.....	.....	.....	.....	73°	.....	103.40°	103.10°	— .30°	136.64	131.93	— 4.71	.....	.....	∞	8.0	
.....	May 5.	16.5	14[7]	?	8 min.[8]	102.40°	— .1	74°	1 hr. 53 min.	102.30°	101.55°	— .75°	102.74	133.45	— 9.29	+ 6.10	+ 1.52	.85	8.1	Twitchings just beginning to appear when dog was put into calorimeter.
6	May 9.	19.5	∞	.....	.....	....	+ .15	70°	.....	103.70°	103.80°	+ .10°	128.10	129.57	+ 1.47	.....	.....	∞	6.6	
.....	May 9.	19.5	13[9]	.....	.....	103 20°	.....	72°	1 hr. 30 min.	103.35°	106.20°	+ 2.85°	119.34	152.02	+ 32.68	— 8.76	+ 22.45	.67	7.8	Dog perfectly paralyzed on entering calorimeter; could breathe and walk on leaving it.
7	May 10.	19	∞	.....	.....	.....	.....	71°	.....	104.20°	104.20°	± 00°	117.12	117.12	± 00	.....	.....	∞	6.2	
.....	May 10.	19	13	.....	8 min.	102.35°	+ .20	73°	35 minutes.	102.55°	104.00°	+ 1.45°	117.12	137.78	+ 20.66	± 00	+ 20.66	.68	7.3	Dog perfectly paralyzed on entering calorimeter; could breathe and walk on leaving it.
.....	May 10.	19	54	.....	.....	104.00°	— 2.4	73°	2 hr. 20 min.	101.60°	99.40°	— 2.20°	97.60	34.90	— 62.70	— 19.52	— 82.32	2.84	1.8	

8	May 18.	10.5	00					72°		101.10°	98 70[8]	— 2.40°	91.50	72 60	— 18.90			00	6.9	
.....	May 18.	10.5	10.5			98.20°	+ .8	73°	38 minutes.	98.40°	96 20°	— 2.20°	98.82	81 49	— 17.33	+ 7.38	+ 9 89	1.00	7.8	Perfectly paralyzed on entering calorimeter; slight muscular twitchings on leaving.
9	May 18.	24.5	00					72°		102.30°	101.80°	— .5°	254.98	245 75	— 9.19			00	10.0	
.....	May 18.	24.5	21[10]	2 minutes.	25 m.[11]	101.85°	— .15	74°	1 hour.	101.70°	103.50°	+ 1.8°	198.60	221.32	+ 22 72	— 56.38	— 24.47	.86	8.1	Dog came from under the influence of curare while in the calorimeter.
10	May 19.	14	00					72°		102.30°	102.20°	— .1°	115 90	114.83	— 1.07			00	8.2	
.....	May 19.	14	16		10 min.	102.6°	+ .1	74°	33 minutes.	102.70°	101.10°	— 1.6°	127.49	110.69	— 16.80	+ 11.59	— 4.14	1 43	7.9	Dog in calorimeter one hour and twenty minutes. Perfectly paralyzed on entering; showed slight incoördinated movements on leaving.
11	June 9.	21.5	00					74°		103.35°	103.40°	+ .05°	196.42	197.23	+ .81			00	9.2	
.....	June 9.	21.5	8.5	3 minutes.	11 min.	103.6°	+ 2.4	77°	1 hr. 25 min.	105.00°	101 60°	— 3 40°	175.68	124.85	— 53.83	— 20.74	— 72.38	.4	5.8	Dog paralyzed on entering the calorimer; slight incoördinated movements on coming out.
12	June 10.	23	00					76°		102.70°	101.10°	— .60°	138.64	128.14	— 14.50			00	5.6	
.....	June 10.	23	10.5			101.9°	— .50	76°	50 minutes.	101.40°	99 85°	— 1 55°	160.00	133.26	— 26.74	+ 21.36	+ 4.12	.46	5.8	Twitchings of abdominal muscles on leaving calorimeter.
.....	June 10.	23	25			99.85°	— .90	76°	25 minutes.	98.95°	97 65°	— 1 30°	71 68	49.25	— 22.43	— 66 96	— 98 86	1 09	2.1	
13	June 21.	29.5	00					81°		102.90°	102.10°	— .80°	198.86	179.66	— 19 20			00	6 1	
.....	June 21.	29.5	8		17 min.	103.45°	+ 1.35	83°	34 minutes.	104.80°	101.60°	— 3.20°	177.50	117.50	— 60.00	— 21.36	— 62 16	.27	4 0	Dog perfectly paralyzed both on entering and leaving the calorimeter.
.....	June 21.	29.5	27			100 80°	— .90	85°	14 minutes.	99 90°	100.30°	+ .4°	134.20	141.70	+ 7 5	— 64.66	— 37.96	.92	4 8	
14	June 23.	25	00					81°		103.20°	102 60°	— .60°	152.5	141.25	— 11.25			00	5.7	
.....	June 23.	25	6[12]		5 min.	101.1°	+ .45	80°	20 minutes.	103.55°	102 10°	— 1.45°	131 76	114.57	— 27 19	— 20.74	— 26.68	.24	4.6	Twitchings in all the muscles on leaving calorimeter.
.....	June 23.	25	75[13]			102.1°	— 1.75	80°	23 minutes.	100.35°	99 05°	— 1.30°	96 38	72.00	— 24.38	— 56.12	— 69.25	3.00	2.9	

[1] Curare injected subcutaneously.
[2] Curare injected subcutaneously.
[3] Curare injected subcutaneously.
[4] This was the same dog that served for the previous experiment (March 31). The numbers here are compared with his normal heat-production and -dissipation on that day.
[5] Curare injected into jugular vein in this and all following experiments.
[6] 97.6° was dog's temperature one hour and forty minutes after injecting the curare. There was a delay in adjusting the calorimeter, so that the dog was taken out and his temperature retaken. It was found to have fallen to 96.1°.
[7] Curare in two doses,—first dose, 5.5 milligrammes; second dose, 8.5 milligrammes; interval, five minutes.
[8] After first dose.
[9] In three doses.
[10] In two doses of 16 and 5 milligrammes respectively.
[11] Time after first dose.
[12] Gave dog 13 milligrammes of curare three and a half hours previously, from which he had recovered for thirty minutes, when the present dose was given.
[13] 25 milligrammes per jugular and 50 milligrammes subcutaneously.

CATACAUSIS EBRIOSUS (SPONTANEOUS COMBUSTION).

By G. Archie Stockwell, M.D., F.Z.S.,
Port Huron, Michigan.

GENERALLY speaking, spontaneous combustion (so called) in the human subject, or indeed in any vertebrate form of life, is regarded with suspicion by the medical profession: First, because it is at variance with laws held to be firmly established; second, on account of its extreme rarity.

Of text-books of later date than Good's "Study," few condescend to admit the possibility thereof, works on medical jurisprudence excepted, while more exclude it altogether from the nosological catalogue. Not only have some of the most eminent authorities pronounced against catacausis, holding it to be the emanation of imaginative and sensational brains, and derived from the works of certain popular novelists, but many of our most expert physiologists and pathologists have been led to authoritatively deny its existence, as being a patho-physiological impossibility. Under such circumstances, it would seem an act of supererogation on the one hand, and superabundant egoism on the other, for the writer to either affirm or deny the existence of this supposed phenomenon. Hence, bearing this in mind, I will endeavor merely to lay the matter before the readers of the Gazette in its various phases, as derived from such evidence as is available in scientific literature, leaving them to draw such deductions as may (individually) seem just.

When we reflect that the human (or other animal) body, in every state with which we are acquainted, whether in health, disease, or after dissolution, is scarcely at all combustible; that it is not reduced to ashes save with the utmost difficulty, and then only with the greatest possible expenditure of heat,—as experience in this most ancient method of sepulture, and the history of those who have been condemned to the stake, abundantly testifies,—we cannot but be surprised that the general expression as regards *combustio spontanea humani* and *catacausis ebriosus* is overwhelmingly negative.

However, in spite of the difficulty of giving credit to so apparently marvellous an occurrence, examples of its supposed existence are so numerous, often so well authenticated, and come to us from so many different countries, sources, and widely-separated localities, that the evidences thereof cannot be wholly ignored or lightly brushed aside. "I confess," says that most eminent writer, M. Pierre Aime Lair,* "that these accounts appear to me to be worthy of very little credit; but they are presented by men whose veracity is unimpeachable,—men distinguished for their learning. Besides, it is not more surprising to meet with such incineration, than a discharge of saccharine fluid from the body, or an appearance of bone softened to a state of jelly."

Dr. Apjohn, of Dublin, with great succinctness and exceeding minuteness, gives the history of four cases of catacausis that occurred in Ireland prior to the year 1830,† of which the following, condensed, is the most illustrative:

A woman, about 60 years of age, residing with her brother in County Down, retired one evening with her daughter, both being (as was their constant habit) in a beastly state of intoxication. A little before daybreak, the members of the family were awakened by smoke and an extremely offensive odor, which pervaded the entire dwelling. These were traced to the apartment occupied by the old woman and her daughter, and found to proceed from the body of the former, which, to employ the language of her brother, as given at the coroner's inquest, "appeared to be burning up with an internal fire." The trunk of the unfortunate woman was further described as "black as a coal, with smoke issuing from every part of the chest." With the greatest difficulty combustion was finally arrested (though no evidence of flame was at any time apparent), when, of course, life was found to be extinct. "While the corpse was being removed into a coffin, which was done as soon as possible, it was continually dropping in pieces."

The daughter who slept in the same bed sustained no injury; neither did the fire extend to the couch or clothing, which exhibited no evidence of the catastrophe other than stains due to smoke and grease. The universal testimony of relatives precluded the possibility of ignition from other than spontaneous causes, as fire and lights were carefully extinguished each night on retiring, solely on account of the habits of the deceased, who had been grossly intemperate for years, and more especially so for some weeks immediately preceding the accident.

MM. Dupuytren and Marc published in detail the history of two cases which they personally had opportunity of observing.

* Jour. de Physique, Ant. viii.

† Cyclopædia of Prac. Med.

MM. Kopp and Lair collated twenty-five cases, deemed by them authentic, of which twenty-four were females and confirmed gin-drinkers. M. Devonald in 1833* chronicled a case occurring in London, which is believed to have afforded material for the tragic death of the mother of Jacob Faithful, as depicted by Captain Marryatt in his novel of that title,† and also for that of Old Krook, as described in "Bleak House" by Charles Dickens.‡

Three years later,—viz., 1836,—in the Commune de Surville, near Pont L'Eveque, occurred the most notable and definite case yet chronicled,§ aside from that of Dr. Apjohn, as already cited, and which involved the lives of two individuals.

On the 7th of September the Procureur du Roi was notified that an old man, of 70, and his wife, ten years younger, both of whom had been long addicted to the immoderate use of spirituous liquors, were supposed to have met with an accident, since their dwelling had been closed for several hours, and they had failed to appear at their usual time or to respond to the repeated calls of neighbors. Further, the information was volunteered that both, when last seen the evening before, were in a horrible state of ebriety, and that a most sickening odor perceived in the locality appeared to proceed from the house by them occupied.

On entering the dwelling a strong empyreumatic odor was observed, and in the principal room, the door, its latch and casings, and the furniture, walls, and ceiling, were found covered with a peculiar grayish, sticky, unctuous, and offensive soot. On opening the shutters this was still more apparent on the windows, marble of the fireplace, and the glasses that chanced to be within the room. And on the floor was discovered a shapeless carbonized mass, in which nothing definable could be recognized but four human legs.

Two of these limbs were covered with black woollen hose (it is somewhat remarkble the degree to which woollens resist the action of heat and flame, and that the flesh beneath may be burned without in the least injuring the texture of the fabric) and prunello gaiters. One of the stockings was very slightly charred at its upper extremity, though the subjacent tissues exhibited no unusual appearance, except that portions of epidermis protected by the boots were slightly reddened. Three inches above the knee, however, the thighs were converted into a black, shapeless, carbonized mass; and except a small portion of the superior edge of the left ilium, nothing could be recognized of the inferior portion of the trunk, which had separated from the superior at the junction of the sacral and lumbar vertebræ. The appearances indicated that this corpse had laid at right angles or nearly so across the one below, the weight of the head and upper extremities causing it to fall forward and separate. The two or three vertebræ which, in consequence, had become exposed to the air, were completely calcined.

The whiteness of the vertebral bones contrasted singularly with the dark, pitchy, carbonaceous mass into which the chest and its contents were converted. The ribs and sternum were completely destroyed, with the exception of the vertebral ends of the first two of the former on the left side, which, though much blackened and charred, still retained their articulations. The bones of the neck (cervical vertebræ) were completely calcined, and terminated superiorly in a white, rounded, and incinerated mass which had formerly been the head. Of this the skull was so friable that, with an attempt to lift it crumbled into powder, leaving it and the brain a mass of ashes, the lower jaw, which rested upon the floor, alone retaining its shape.

Under the remains of this corpse, as already noted, lay the débris of a second. Of this the left lower extremity was bare, and spotted throughout its anterior surface with vesicles filled with reddish serum, the contents of which upon exposure to air were immediately dissipated in a flash of blue flame; but, posteriorly, along the whole extent, the leg was burned and scorched to the very bone, the latter being half calcined. It was almost quite detached from the pelvis, and exuded at the upper part a most hideously fetid oleaginous fluid. The right leg, partially flexed upon the thigh, rested with the knee upward, the sole of the foot pressing the ground. The ankle-joint was infiltrated with dark serous fluid, but the joint of the knee was laid quite open and completely desiccated. Also the thigh-bone had snapped across at the junction of its lower and middle thirds.

From just above the fractured point on the right limb, both thighs were converted into a confused mass of unctuous charcoal; and the pelvis and contents, as well as the trunk superimposed, were entirely consumed. It was immediately above the pelvis of the second corpse that it was crossed by the first; and it was by

* British Med. Jour., 1836.
† First published in 1838.
‡ First published in 1854.
§ Jour. des Connais. Méd.-Chirurg., September, 1836.

no means easy to separate the adhesions that existed between the two, owing to the slow and stifled combustion that must have taken place, and that, so to speak, welded the two together.

The liver and right lung of the under body presented comparatively natural appearances, and were easily recognized, having been well protected by the carbonized layers of clothing, and the superadded mass of the other corpse, but they had shrunk to about half their normal size, presenting hard, brittle, shining surfaces, which, under the scalpel, exhibited the consistency of cheese. Spine and ribs were alike reduced to charcoal of most solid consistence, being much more firm than that resulting from combustion of the soft parts. The head of this corpse was entire, but so besmeared with sooty and unctuous matters, and so generally disfigured, that the features were unrecognizable: and though the projection of the nose and hollows of the orbits were readily definable, they disappeared,—the bones giving way and crumbling into numerous pieces,—the moment an attempt was made to lift from the floor. The brain, "shrivelled and hard as a piece of horn, and not larger than a hen's egg, rested upon the rim of the spinal opening at the base of the skull."

Of the upper extremities of both bodies, the only remains were a calcined portion, some three or four inches in length, of the bone of one arm, and a few bones (metacarpal) of the hands; and even these were quite incinerated. Exclusive of the lower extremities, which were much less reduced than the upper parts, the entire weight of the débris of both bodies did not equal *four pounds!*

The floor on which the bodies lay was soiled with the same unctuous, sticky, and stinking substances that pervaded the ceiling and walls, and the débris of the two corpses was surrounded by the following objects: a table, close to the feet that were farthest from the fireplace, not in the least scorched or injured save only as it was covered with the unctuous substances already mentioned,—this held a bottle and two glasses, all containing *eau-de-vie;* a fireplace, along with a high fender filled with ashes, close to the two heads; a gridiron, which had fallen beneath the body of the under corpse (presumed to be that of the woman); and a brand of wood, still ignited ("*un tison encore enflamme*"), lying between the two heads. Beside these, a single shoe lay to the right of the bodies; and to the left, between the wall and the lower extremities of the remains supposed to be those of the man, stood a chair, very slightly scorched as to varnish.

The period in which the combustion had taken place, counting from the time the unfortunates were last spoken up to the forcing of the door by the authorities, could not have exceeded twelve, or at most fourteen, hours!

With regard to the non-appearance of *true* spontaneous combustion in the human subject of late years, no one is in condition to speak. Certain it is, the consumption of alcoholic beverages has not decreased to any appreciable extent, but, on the contrary, in some portions of the globe has greatly *in*creased. Catacausis as the sequel to ignition, however, has been observed in a few isolated instances, the last of which I can find any record (one of a series of three, which will be cited further on) occurring in 1887.

Strange to say, too, peculiar accidents appear to be epidemic, as it were, several following in rapid succession, though through what psychical laws or phenomena of coincidence they are brought about, is entirely beyond the human understanding. For instance, the vulgar hold that after a long period of immunity, one conflagration will be followed by a second and a third, ere another period of immunity occurs, and observation gives fair confirmation; and the theory was recently well exemplified in Michigan, where a totally unheard-of accident was followed in quick succession by two more of precisely the same character.

The question as to the spontaneity of human combustion admits of no little argument, in spite of the fact that certain works on jurisprudence have affirmed it. It seems to be a well-authenticated fact, however, that bodies have in some strange manner become ignited, and partially or almost wholly consumed, leaving only a mass of charcoal, ashes, and incinerated grease. Some of these cases have been traced to stoves or open fires, some to lamps, candles, and pipes, others to strokes of electricity or lightning;* but a few, in spite of all study and research, no matter how thoroughly or carefully conducted, elude all effort to elucidate a cause; and it is these last that have given rise to the theory of spontaneous development. In no case, so far as known or reported, has the entire body been destroyed, some portion or portions being merely scorched, while of the residue nothing remained but a few ashes, or a trifle of charcoal mixed with black unctuous matter. And that there must have been something more than mere contact with flame

* Foquet, *Jour. de Méd.*, tome lxviii.

or fire, is apparent from the fact that the thoroughness and completeness of the reduction of animal tissues and matters is unparalleled, and that the heat, though so powerful as to consume the most incombustible portions of the body, is yet almost or wholly devoid of flame, and apparently powerless so far as ordinary substances are concerned, since it is resisted by wood, clothing, and other inflammable matters, even though brought in direct contact therewith. Moreover, it must be observed that the victims are invariably stricken down suddenly and without warning, while those of ordinary accidents by fire rush hither and thither in their frenzy, falling only when completely exhausted or overpowered.

The peculiar chemical state of the body that could induce a catacausis, to say the least, is both singular and mysterious. Dr. Thomas Younge,* I believe, was the first to embody catacausis in a medical treatise, and attempt a scientific explanation thereof; and he also created for it a new genus in medical nosology, derived from *κατακαιω*, "I burn," from which Dr. Good† formulated the specific title of *catacausis inebriosus*, which he defines as a "constitution inflammable in consequence of long and immoderate indulgence in spirituous liquors: the combustion *easily excited or spontaneous.*"

The bodies of habitual topers have not, as a rule, however, been found especially combustible; neither do flesh or morbid specimens, even after long saturation in alcohol, exhibit any such property, but rather the reverse,—the alcohol alone is consumed, the specimen being charred upon its exterior merely. For these reasons it is evident that an inebriate catacausis must be due to chemical changes solely, taking place within the economy or tissues, though exactly of what such changes must consist, is as yet beyond the grasp of science.

In the majority of instances the clothing of the victim is destroyed (though in a few it is but little damaged, or at most slightly scorched or charred) where it is immediately contiguous to the parts of the body most involved. But the thick, greasy, offensive soot evolved permeates everything, covering walls, ceilings, and furniture, even making its way through the joints of doors, windows, and casements, into adjoining apartments.

On a few occasions the human body, if we may believe the testimony of veracious witnesses, has been discovered in the very act of combustion, a bluish flickering flame being emitted; and we are assured by all authorities and observers, that water, far from quenching, tends to add fuel to the fire.

From the proportion of cases which have met death while in close proximity to fire or flame, it seems more than probable that ignition in a majority of instances did not take place spontaneously. In one case, as detailed by Dr. Apjohn, combustion occurred apparently as a sequel to an attempt to light a pipe with a live coal, the flame being described by an eye-witness as "bursting out from the throat and bosom all at once,"‡ the woman "falling instantly, as if felled by a bludgeon."

Several cases, however, cannot be thus satisfactorily accounted for. In that first cited in this paper, the sworn testimony of the inquest evolved the fact that neither light nor fire existed in the dwelling at the time of the accident, and that, moreover, the "stupid condition of the daughter, not less intoxicated than the mother, indicated that neither were in condition to search for, much less strike, a fire." This, of all cases I have been able to discover by extensive research and examination of medical and other scientific literature, presents the most reasonable and convincing evidences of being a *bona fide* instance of spontaneous combustion in the human subject.

M. Duvergie,§ from personal study and observation, unhesitatingly declares that spontaneous catacausis is not only possible, but probable; and he suggests that the modification in the human economy permitting such phenomenon, is due to the action of the forces in the living body rendering the tissues combustible by absorbing a large amount of alcohol, or by transforming alcohol into still more inflammable compounds. In defence of his position, apparently, and to prove that pathochemical changes may take place that favor inflammability of animal tissues, he cites two well-authenticated cases,‖—one of a young man, the other a girl scarce out of her teens, both perfectly healthy seemingly, not possessed of unusual obesity, and *strictly temperate* in habits, who, with no premonitory symptoms of disease, had flame communicated to the ends of the fingers, setting fire to the clothes that enveloped them; and though im-

* Younge's "Medical Literature," 1813.

† Good's "Study," vol. iii., 1829.

‡ Alexandré, "De Spontanea Humani Conflagratione," 1830.

§ Philosophical Transactions, vol. xiii.

‖ Philosophical Transactions, vol. xvi.

mersion in water extinguished the fire, it broke out spontaneously the moment the hands were dried. The effect did not extend beyond the hands, and, the flames being smothered, the burns healed readily and kindly, with no other loss than of a slight amount of epidermis and one or two nails.

The most modern case of supposed catacausis that I have been able to resurrect is that reported by Dr. George O. Williams, of Greene, Chenango County, N. Y., occurring in a youth, of 18 years, as a sequel to a gunshot wound. It is reported as follows :*

"He had dinner at noon. The body was found at 2 P.M. lying on the dry plank floor of the stable. The clothing inventoried one pair of cotton trousers, one overalls, one—possibly two—cotton shirts, and shoes and stockings; estimated weight, exclusive of shoes, four pounds. All the clothing was consumed, except fragments on the ankles and one shoulder. These were still burning, but without flame, when the body was discovered. An edge of the plank on which the body lay was charred for six inches, and at one point a small flame appeared. The surface of the plank beneath the body was slightly browned for a diameter of twelve inches. The skin, even on the face, was deeply burned,—cooked,—and fully one-half of the surface of the body was deeply browned in detached areas. On these areas were gaping fissures in the skin, four to twelve inches long, exposing wasted fat, and in some places muscular tissue. The fissures in the flexures of the thighs and knees were deep, and the exposed tissues tender. The genitals were charred, the foreskin crumbly. On making a section, the tissues felt, under the knife, and looked, like any roasted flesh, to some extent even on the internal thoracic walls. A cartridge-ball had traversed the upper and lower lobes of the left lung, and the right auricle and left ventricle of the heart. Coagula filled the thorax; the lungs were collapsed. He had taken whiskey during the forenoon, quantity unknown; and his habits were reported to have been somewhat unsteady. The query arose, Why should the body have been so deeply and extensively cooked with the limited amount of fuel (four pounds of cotton clothing) and at the same time the dry planking beneath so trivially damaged?"

Doubtless many readers of the GAZETTE have encountered topers whose pulmonary exhalations, on coming in contact with flame, gave a luminous effect,—produced scintillations of blue light. Several such cases are recorded in medical literature, and would seem to have more or less bearing upon the history and phenomena of catacausis. One of the most notable of these † occurred in the almshouse near Liverpool, England, on the evening of November 16, 1844, when, for twenty minutes previous to death, a patient emitted luminous breath compared by the attendants to a "red-hot coal-like streak." The unfortunate, some fifty years of age, and who had been denied spirituous liquors for forty days, suffered from dropsy as a sequel to chronic alcoholism, complicated with hemorrhage from bowels, cough, and expectoration. The phenomenon was first observed by the male nurse in the ward, who called the attention of others to the "red-hot appearance of the dying man's cheek." There was no possibility it could have been caused by reflection from the fire in the fireplace, or from the burning gas-jet, both of which were very low; and, unfortunately, the lookers-on regarded the matter from a moral rather than scientific stand-point, and did not mention it to the attending surgeon until long after interment, when it was too late for post-mortem examination.

A parallel case is reported by Dr. William Huggins, of Trinidad, West Indies.‡ On the night of August 7, 1844, the black, who was nursing a habitual toper, prostrated with diarrhœa and dyspnœa resultant upon excesses, called the overseer of the estate (an American Quaker of undoubted veracity), stating the patient was rapidly approaching dissolution. The latter arrived just in time to see the man die, and plainly observed a flame of bright color issuing from his mouth, and immediately disappear. Says Dr. Huggins: "When he told me of it the following day I laughed at him, saying he must have seen a reflection from the candle in a bubble of saliva. He replied, it could not have been so, from the position of the candle; and on my inquiring of the black attendant I found that he also had seen what he termed 'fire come out of the man's mouth.'"

Doubtless, too, some of my readers may have encountered the bloated and besotted specimen of humanity that during the summer of 1877 perambulated the streets of New York and Brooklyn, exhibiting himself in bar-rooms and restaurants as possessed of

* Med. Record, August 13, 1887, p. 183.

† Transactions Liverpool Pathological Society, 1845.

‡ Lancet, September 6, 1845.

a luminous and inflammable breath. Armed with a small tin dish, the bottom of brass strainer-cloth, he would respire into the flame of a taper or gas-jet, thereby procuring sparkling scintillations of blue light. This was his means of securing the desired libations of the ardent; and it may be that his subsequent demise by drowning saved him from a more horrible fate.

MM. Bianchini, Raffei, Rollin Le Chat, Vicq d'Azyr, Kopp, Marc, and other gentlemen, equally distinguished for learning and physiological and pathological research, from the histories evolved, unhesitatingly advance the opinion that ignition of the human body does not always depend upon the application or approach of a burning object, but that it may, and does, develop primarily and spontaneously in the economy itself.*

Apropos of this, it is well known that many inorganic and non-inflammable objects, under certain circumstances and surroundings, will, of themselves, become heated and inflame. Combustion has even been known to occur spontaneously in heaps of ashes that had not been added to or in any way disturbed for months or years.† Again, many chemical combinations will cause ignition, either immediately or by continued exposure to the oxygen of the atmosphere: thus, when nitric and sulphuric acids are together brought in contact with an essential oil, the whole at once bursts into flame. It is upon such and similar facts that M. Bianchini *et al.* base their belief that animal bodies, in either life or death, may through physiologico-chemical changes spontaneously ignite.

The development of the electrical spark on the one hand, and the imbibition of all the tissues of the economy with spirituous and inflammable liquids on the other, especially when at the same time there is an abundant deposit of adipose in the cellular substance, are circumstances which many physiologists have considered as all-sufficient to procure and feed a catacausis. It is well known to pathologists, also, that alcoholic beverages, employed to excess, may be quickly absorbed into the blood, and thus speedily diffused throughout every part of the body. For example, MM. Cuvier and Dumeril were struck with the strong alcoholic odor exhaled from every part of the corpse of a man who met his death by swallowing an extraordinary amount of brandy in compliance with the terms of a wager.‡ Again, M. Breschet mentions observing the same phenomenon in a criminal after execution, whose last moments had been gratified by repeated libations of spirits; and he adds the important fact that "fat animal substances are always found to burn much more quickly than lean, and still more quickly if saturated with alcohol." He observed this frequently in the anatomical theatres of Paris, when he wished to speedily get rid of the débris of the dissecting-table.§

M. Marc concluded, from numerous observations and experiments, that animal bodies may engender and become impregnated with inflammable gaseous matters, and that these may ignite, either upon the approach of any lighted body or by the action of an internal electrical current; and a case is by him cited, occurring in the Hôtel Dieu, which in a measure corroborates the first portion of this hypothesis:‖

The body of a male patient, that died suddenly from obscure disease, was held for autopsy, but owing to preoccupation of the hospital staff, was not examined until the eighth day, when it presented unmistakable evidences of decomposition. The whole surface of the corpse was swollen and bloated from distension of cellular tissue, and covered with vesicles containing either reddish serum, or gas. The cavities of the abdomen, thorax, and also the ventricles of the brain, were found distended with the same gas that filled the vesicles, presumably carburetted hydrogen since it caught fire and burned with bluish flame on the approach of a candle.

With such evidence before us, and knowing that decomposition to considerable extent may take place before life is extinct, the theory of spontaneous combustion in the human or animal subject seems less problematical. Moreover, it is not at all improbable that where carburetted hydrogen is developed, it may be replaced on occasions by the still more inflammable phosphuretted gas, which ignites upon mere contact with atmospheric air: there is absolutely nothing in the chemical combination and construction of the physical economy that is inimical to such evolvement. The *ignis fatuus*, "will-o'-the-wisp," and so-called "elf-candles" are supposed to owe their origin to phosphuretted hydrogen, and they are

* *Surgical Review*, Ploncquet, "Littérat. Méd.;" Dupont, "De Corporis Humani Incendies Spontaneis."

† American Jour. Med. Sciences; Am. Cyclopædia.

‡ Robie on Alcohol.

§ Gazette Médicale (Dijon), 1844.

‖ Bartholin, Act. Hafon., i., Obs. 113.

found only in neighborhoods where decompositions of animal and vegetable matters are constantly occurring, such as cemeteries, marshes, dung-heaps, and low wet grounds. In Oriental and tropical countries where interment is practised, they are most frequently observed in and about tombs and burial-places, especially where bodies are inhumed at shallow depths and the torrid heat of the sun has baked the surface, causing the ground to crack and gape, allowing free passage for the gaseous products of decomposition. Neither have we any authority for denying that phosphuretted gas may be developed as a sequel to chemical change within the living body, for the elements essential thereto are never absent: and in such case, if oxygen be present, the mixture necessarily assumes an explosive character adequate to effect the rapid combustion affirmed of spontaneous catacausis. It may likewise be remembered that "elf-candles" and "will-o'-the-wisps" are unable to ignite ordinary substances, and that the combustion of human bodies that has been deemed spontaneous has proved equally inert!

The medico-legal aspects of catacausis, whether spontaneous or communicated, are particularly interesting: First, to quote Stillé and Wharton, because, "In approaching the examination of the question, whether such a phenomenon is really possible, we encounter the usual obstacle to the discovery of the truth, viz., a doubt as to the authenticity of the fact upon which the belief reposes." These authors quote three* cases, none of which, however, are as satisfactorily substantiated as those already presented in this paper, and which appear to be unknown or altogether overlooked by jurists. Second, the general doubt that must exist as to spontaneity. Third, the incompetence of the majority of witnesses, who are of the laity and biased by both superstition and excitement.

However, accepting the evidence in the main as true, one strange fact remains,—that, of the seventy-two cases of spontaneous combustion and catacausis that are chronicled in medical literature (some dating back more than two centuries), the majority are women in advanced life, addicted to the immoderate use of *gin*,† a liquor largely imbued with empyreumatic oils. This may be further accounted for by the tendency of the sex to the accumulation of adipose, and that drunkenness when indulged in by women is usually carried to greater excesses than by men, which is to be expected from the more exquisitely sensitive nervous organization of the former.

So far as I have been able to discover, the claims of spontaneous combustion have not demanded the services of experts in courts of justice above three times. One of these cases will be remembered by many of the older readers of the GAZETTE. I refer to the trial of John Staff for the murder of the Countess of Garlitz at Darmstadt,‡ the defence being spontaneous catacausis, the body of the unfortunate lady having been partially consumed by fire. Ingenious arguments were advanced by many of the most learned of the legal profession to convince the court that this, and this alone, was the cause of death, and with such success that the trial was carried over some months. Meantime, the body of the lady was exhumed and examined by experts, who detected a fracture of the skull and other evidences of murderous assault that must have been received prior to the action of fire; moreover, the thorax had suffered little, the extremities and the head being the parts consumed.

January 31, 1889.

A BACTERIOLOGICAL MANIPULATING CHAMBER.

BY SAML. G. DIXON, M.D.§

THE apparatus about to be described is adapted to retain to a reasonable degree a sterilized working space during the manipulations requisite for the cultivations, etc., of bacteria.

To use the manipulating chamber—for example, to inoculate a number of test-tubes—the operator proceeds as follows: The tubes to be inoculated, filled with the requisite quantity of nutrient gelatin or agar-agar and plugged with sterilized cotton, are placed in the chamber in wire baskets or on the rack (No. 3), together with needles, slides, cover-glasses, etc., and the lids (No. 5) securely clamped over the apertures *a*. The ventilating aperture at the top of the chamber should be filled with cotton to allow the free exit and entrance of uncontaminated air as the apparatus is heated and cooled. Or, if desired, a small thermometer may be intro-

* Pages 420, 421.

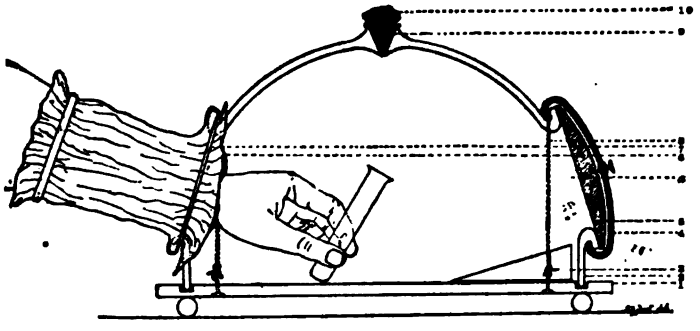
† London Medical Gazette, 1850.

‡ Stillé and Wharton, "Medical Jurisprudence."

§ Professor of Hygiene, University of Pennsylvania, Phila., Pa.

duced through this opening, and the cotton packed around it. The whole is then sterilized in a hot-air sterilizer, taking care to have the temperature in the interior of the chamber sufficiently high to destroy all spores as well as bacteria, or else to reheat the chamber on two or more days.

After cooling, and immediately upon the removal of the apparatus from the hot-air sterilizer, the cords (No. 8) are passed over the necks of the apertures (*a*), and fastened to the bed-plate to prevent the cover from being accidentally lifted from the latter at any time during the manipulations. If neces-



No. 1 represents an iron plate, grooved on top to receive No. 2.

No. 2. A round glass cover, sixteen inches in diameter and ten inches high.

No. 3. A rack for instruments, test-tubes, etc., preferably made of glass.

a. A round aperture about four inches in diameter. (The lips at the margin of this opening and of its fellow opposite must be ground perfectly flat.)

No. 4. Iron clamp with thumb-screw, to hold in place No. 5.

No. 5. A glass cap or lid made with one flat ground surface to fit on ground surface of lips around the aperture *a*.

No. 6. Thin rubber sleeves twelve inches long and eight inches in diameter.

No. 7. Thick rubber bands.

No. 8. A cord stretched over the neck of "*a*" and hooked down to the bed-plate (No. 1).

No. 9. An aperture to receive a thermometer or No. "10."

No. 10. A cone-shaped sterilized cotton plug.

sary, a little oil or paraffine can be poured into the groove in the bed-plate.

The rubber sleeves (No. 6) are thoroughly washed, inside and out, first in soap and water, then in bichloride of mercury solution, and, while still wet with the latter, are slipped over the hands and arms of the operator, these also having been thoroughly washed and disinfected, until the fingers reach to the farther ends of the sleeves. Great care must be observed not to admit air into the sleeves. The thick rubber bands favor this exclusion of outside air by closely adapting themselves to the varying contour of the fingers, hands, and arms.

The right-hand glass cap is then washed and disinfected, the lower end of the corresponding sleeve is firmly pressed against this cap, and the fingers stretch the band over the lips of the aperture and allow it to contract around the neck of the same. Then the clamp is unscrewed, and lid and clamp are permitted to drop into the sleeve beside the operator's arm. The hand has now free access to the sterilized chamber. The left hand is conducted into the chamber in a like manner, carrying with it the tube containing the culture for inoculation. In order that this last tube may be thoroughly sterile as to its exterior, a well-washed and disinfected rubber cap (an ordinary finger-stall) is slipped over the cotton plug of the tube, and the tube then washed in the bichloride solution. Now, when the rubber cap and cotton plug are removed from the tube in the chamber, the cap, by contracting upon and enclosing the plug, will prevent any germs that may have been entangled in the cotton from escaping into the atmosphere of the chamber.

After both hands of the operator are in the chamber, they can be dried, if necessary, on a little absorbent cotton, placed for the purpose on the floor of the chamber. The cap and plug are then slipped from the tube containing the growth, the sterilized tubes taken up one after another, inoculated, plugged, and laid aside, slides prepared and cover-glasses adjusted, just as is ordinarily done in the laboratory.

When all the desired work is accomplished, the hands are removed, the cords unfastened, the glass cover lifted from the bed-plate, and

the inoculated tubes and slides stored away or placed in an incubator, as the operator desires.

In the same manner plate cultivations may be made. In fact, all chambers for plate or potato cultivation should be made on this or a similar plan, inasmuch as the large area of the plates or potatoes greatly increases the danger of contamination while they are being prepared and inoculated.

Cover-glass impressions may be made from time to time from the same plate. Or, with such an apparatus, a microscope may be inserted through one of the arm-apertures, the objective and eye-piece removed, a cotton plug placed in the draw-tube, and the space around the microscope in the aperture packed with cotton, the whole sterilized by heating, a plate cultivation made on a slide, the objective washed in a solution of carbolic and lactic acid and applied, the eye-piece inserted, and the same growth observed from time to time. Yes, it may even be photographed at any period of its development, or many times, by means of the appliance for making photomicrographs with the microscope in the upright position devised by Dr. Seneca Egbert, of this city, and described by him in *The Microscope* for October, 1888.

Again, small organs or animals may be dissected, living ones inoculated, and any of the ordinary bacteriological operations performed with the minimum of danger of contamination.

The above manipulations may seem tedious or complicated, but are in reality very simple, and will take far less time than is here necessary to describe them. And, if we are to believe that there are micro-organisms, many or few, contaminating the air of our laboratories, the use of such appliances is certainly a step towards scientific accuracy, and the results thus obtained must be *the more valuable* as they are *the more accurate.*

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*THREE CASES OF VALVULAR INSUFFICIENCY.**

By W. G. Kemper, M.D., Omaha, Neb.

MY attention was first called to this subject by the following case: A pauper, 64 years of age, suffered from frequent attacks of shortness of breath. He was often examined by different physicians in the neighborhood, all of whom considered the case an excellent one illustrative of organic mitral disease. A murmur, distinctly audible by the unaided ear a few inches from the chest, replaced the first sound, and was loudest at the apex. Percussion-dulness was increased towards the left. The pulse was frequent, weak, and irregular. The lungs showed symptoms of œdema. Liver and spleen were enlarged. The urine was not albuminous. The man had worked hard in his earlier years, but at this time he did such work as he felt able. He had never had rheumatism, if an occasional lumbago was excepted. Many remedies, among which I remember digitalis, convallaria, and nitro-glycerin, were tried, without success. The patient's condition remained about the same, until eventually he died of an inflammatory bowel-disease; and at a post-mortem held the following day this condition was found: The left side of the heart was considerably dilated and hypertrophied; the right side slightly so. The mitral valve was not diseased, but the ostium was enlarged to such an extent that the valves were insufficient by about a line to prevent regurgitation. The kidneys were healthy. I believe that cases of this kind are more common than is generally supposed, particularly among the aged, those who have been obliged to do hard labor and were unable to obtain good food. The symptoms came on very gradually, with no history of rheumatism. It is doubtful whether patients of this kind can be improved by treatment. In the younger cases Oertel's treatment might be of benefit, if it could be carried out. But it is *positively* known to be of benefit *only* in those cases which owe their origin to a want of proper exercise. A heart-tonic is indicated; digitalis is probably the best.

The second case is that of a farmer, 17 years of age. He had done very hard labor on the farm during the year, and was complaining when I saw him of dyspnœa and palpitation, which became worse with every muscular effort. His face was cyanotic and pale; his lower limbs œdematous. Percussion-dulness extended about one-fourth inch to the right of the sternum, and an equal distance to the left of the left mammillary line. A loud systolic murmur at the apex was followed by a feeble second sound. At the base the sounds were weak but clear. The lungs showed symptoms of œdema. The pulse was almost imperceptible. There was no history of rheumatism, and his family was healthy.

* Read before the Omaha Academy of Medicine, February 5, 1889.

He had noticed symptoms of weakness about four months. He was advised to go to bed, and digitalis with small doses of iron and good nourishment were prescribed. Under this treatment he recovered very rapidly; and a month later I could not find the slightest symptom of heart-disease. In this case the large area of dulness and feeble heart-sounds pointed to dilatation of both ventricles, to which evidently the mitral insufficiency was due.

The third case is that of a young married lady, to whom I was called on November 9, 1888. She had the evening before attended a party, at which dancing was the principal amusement. She danced often, but was obliged to discontinue the exercise on account of breathlessness, which discomfort troubled her until she had returned home and had fallen asleep. She was accustomed to dancing, but in this case the dancers used a canvas instead of a waxed floor. This she thought was the cause of her fatigue. On arising the next morning she had a succession of fainting fits, and was obliged to return to bed. Her pulse was 105, at times weak and frequent, then full and very slow. In four consecutive quarter-minutes I counted 23, 30, 24, and 28 beats. She had no fever. Per auscultation of the heart I discovered a blowing murmur, with the first sound at the apex. At the base the sounds were normal. The heart-dulness was not increased. Her occupation was light. She had always been healthy, and had never suffered from heart-symptoms previous to this attack. The patient remained in bed for three days, during the first two of which she took 2-grain doses of bromide of caffeine, after that 10-drop doses of fluid extract of digitalis. On the third day her pulse was 86, but regular; the blowing murmur was very faint. Two days later the heart-sounds were normal; the pulse 80. Since that time I have examined her twice; but at neither time was I able to detect a symptom of heart-disease. This case was peculiar. There was mitral insufficiency, but I found no signs of dilatation. Nevertheless tight-lacing and fatiguing exercise may have produced a relaxation, which temporarily increased that normal insufficiency, which many physiologists claim is often present with no other symptoms in health.

In conclusion I would ask this question, May not relaxation of the chordæ tendineæ and papillary muscles be a cause of regurgitation?

1524 South Seventeenth Street.

ALKALOIDS OF THE ARECA-NUT.

The areca-nut, as it is known, is extensively used as a masticatory by Asiatics, and comparatively recently certain statements made as to its virtues as a vermifuge won for it a temporary place in the British Pharmacopœia. According to "Pharmacographia" its principal constituents are crystalline fat and red amorphous tannic matter; but about three years ago Herr Bombelon announced that he had separated from the nut by means of ether a volatile liquid alkaloid that he named "arekane" (*Pharm. Journ.* (3), xvi. 838). The nut has been further investigated by Herr Jahns, who reports that he has separated from it three alkaloids by precipitation of an acidulated water-extract with iodide of potassium and bismuth and sulphuric acid and suitable decomposition of the precipitate (*Berichte*, xxi. 3405). "Arecoline," the most important of the three, is described as a colorless, oily liquid, having a strong alkaline reaction, soluble in all proportions in water, alcohol, ether, and chloroform, and distilling at about 220° C. Its composition corresponds to the formula $C_8H_{13}NO_2$, and it forms salts that are mostly crystalline, readily soluble and hygroscopic, but the hydrobromide is stable and non-hygroscopic. Preliminary physiological experiments have shown this alkaloid to be poisonous, and to be probably the active constituent of the areca-nut, to which its reputation as a vermifuge is due. In this respect, as well as in its chemical and physical properties, arecoline appears to approximate to pelletierine, the alkaloid of pomegranate-root bark, which is represented by the formula $C_8H_{15}NO$. "Arecaine" ($C_7H_{11}NO_2 + H_2O$), the second alkaloid, forms stable colorless crystals, readily soluble in water and dilute alcohol, less soluble in stronger, and almost insoluble in absolute alcohol, and insoluble in ether, chloroform, and benzol. An aqueous solution is neutral in reaction, and has a faintly saline taste. Arecaine combines with acids to form crystalline salts having an acid reaction and soluble in water. In its properties it appears to stand near to trigonelline, the alkaloid of fenugreek-seeds (*Pharm. Journ.* (3), xvi. 447), and, like it, appears to be physiologically inactive. The third alkaloid, as obtained, was amorphous, strongly alkaline, readily soluble in water, alcohol, and chloroform, and with difficulty in ether, but was in too small quantity to be investigated. —*Pharmaceutical Journal and Transactions*, February 2, 1889.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
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Leading Articles.

PHENACETINE.

APPARENTLY one of the best of the modern antipyretics is a substance described by Hinsberg and Kast as para-acetphenetidin, a substance analogous as regards its chemical constitution to antifebrin. We have already a number of times alluded to the properties of this substance (THERAPEUTIC GAZETTE, 1888, pages 43, 142, 699), and although the testimony as to the action of this preparation as an antipyretic and antineuralgic appears to be unanimous as to its value and freedom from danger, it has attracted no attention among English-speaking members of the profession. This preparation, phenacetine, as first prepared, was a reddish, odorless powder, insoluble in water and in glycerine, and thoroughly soluble in hot alcohol and alkaline liquids. It has been recently prepared in colorless, crystalline needles, which are claimed to be soluble in acetic and lactic acids and in hot oils. Extended experiments on dogs and rabbits have shown that it is almost inert in doses of from 15 to 30 grains given daily for days at a time. When the dose is increased up to 45 and 75 grains in large dogs it produces accelerated respiration, sleepiness, disturbed co-ordination, and vomiting, and, in still larger doses, methæmoglobin is produced, as in antifebrin-poisoning. Even after this symptom has appeared, however, recovery has almost invariably occurred. Dr. Hoppe (*Deutsche Medizinal Zeitung*, 1888, No. 92) has made a number of experiments on man, administering doses of from 15 to 40 grains, and has found that after a time the system becomes accustomed to the remedy. The only disagreeable effects produced by these amounts were sleepiness, dizziness, nausea, and slight chilliness, the temperature, as consequent on doses of 30 grains, being only reduced a few tenths of a degree Centigrade. It appears, therefore, to be almost free from toxic properties, while his experiments made in the Jewish Hospital in Berlin have confirmed the result of the experiments as already published by other observers. It has proved absolutely harmless, the only disagreeable after-effect being profuse perspiration, ringing in the ears, followed by weakness, and only in individuals already depressed by disease. As an antipyretic in children, doses of about 2 grains reduce the temperature from 1° to 2° C., a single large dose producing more effect than repeated small doses.

Led by the analogy of phenacetine in composition to antipyrin and antifebrin, Dr. Hoppe has likewise tested the properties of this drug in twenty-five different forms of neuralgia, in the majority of which relief of pain followed its employment. Various cases of headache were also relieved by its use within half an hour to an hour; and he believes that in neuralgia, as in febrile disease, it is equally as efficacious as antipyrin, and is preferable to it on account of its freedom from danger.

Dr. Rumpf (*Berl. Klin. Wochenschr.*, No. 23, 1888) likewise experimented to a considerable extent with phenacetine as an antipyretic and in the treatment of neuralgia. Dr. Rumpf believes that as an antipyretic it is as active as any yet introduced, since he has found that a single dose of 15 grains given to adults may reduce the temperature in the febrile state from two to three degrees in two hours; even half the dose has produced the same effect with no disagreeable complications. In eight cases of hemicrania doses of 15 grains produced great relief, while in seven cases of neuralgia of different nerves it has likewise been very satisfactory. Dr. Rumpf describes phenacetine as a drug which, in doses of 15 grains to adults or 3 grains to

children, is an absolutely safe, reliable, and satisfactory antipyretic; while in doses of 15 grains it is highly recommended as an anti-neuralgic remedy in all cases of vaso-motor neuroses, in the lancinating pains of tabes and the neuralgias of chronic neuritis.

Drs. Misrachi and Rifat (*Bulletin Gén. de Thérapeutique*, June 22, 1888) have confirmed in all respects the statements which we have already published as to the action of this remedy. It is these authors who have determined the solubility of phenacetine in lactic acid. They have found that this solution is not disturbed by the addition of water as long as the temperature does not fall below 33° C. It is evident that this discovery is a great addition to the practical value of this remedy, since its high insolubility has been the principal objection to its use in therapeutics. After the administration of the lactic-acid solution it is rapidly absorbed, and has been capable of detection in the urine.

COCAINE POISONING.

THERE have been recently reported several cases of cocaine poisoning which seem to be worthy of note. In a case of chronic cystitis under the care of Dr. Alejandro Settier, of Madrid (*La Medicina Practica*, December 15, 1888), the patient had been in the habit of injecting daily into the bladder twenty to thirty grammes of a four per cent. solution of cocaine. Dr. Settier, wishing to use injection of nitrate of silver, in order to render the bladder insensitive, injected a four per cent. solution of cocaine. On the second day of this treatment the solution of cocaine was allowed to remain for twenty minutes, and afterwards, the caustic solution having caused much pain, a second cocaine injection was given, and retained fifteen or twenty minutes. A few minutes after this the patient began to talk with the greatest volubility and a thick quavering voice with indistinct utterance. He complained of giddiness, was restless, with an unsteady gait, dry whitish tongue and mouth, cold perspiration over the whole body, and small, thready, rapid pulse, and several times repeated vomiting.

Much more serious cases have been reported by Dr. Zambianchi, of Vigevano, and Dr. A. Montalti, of Florence. (*British Medical Journal*, February 16, 1889.) In Zambianchi's case about two hundred and twenty-five milligrammes of cocaine were injected hypodermically into the breast. Almost immediately epileptiform convulsions came on and lasted fifteen minutes, with arrest of respiration. Under artificial respiration the woman rallied momentarily, but the convulsions reappeared, and five minutes later death occurred. In the case of Montalti 1½ grammes of the hydrochlorate of cocaine were given by the mouth, through mistake, to a patient suffering from phthisis. Fifteen minutes afterwards wandering delirium appeared, with ineffectual vomiting, marked fall of temperature, pale face, dilated pupils; cyanosis soon became apparent, and the pulse grew imperceptible. Unconsciousness developed, followed in a very short time by death. At the post-mortem, intense congestion of the brain and spinal cord with their membranes was found; the brain-surface being covered with a thin layer of blood and the subarachnoid space full of serum. On section of the brain-substance minute bleeding points everywhere appeared, giving rise to confluent drops which spread over the whole cut surface. The heart was firmly contracted; the spleen, liver, stomach, and small intestine were excessively congested; the kidneys normal. Another fatal case of cocaine poisoning was recently the subject of inquest at the University College Hospital, London. A 20-grain solution in a glass of water had been ordered by the house surgeon without direction, but with the word "statim" written upon it, a customary indication that the solution is to be dispensed immediately; the apothecary, misunderstanding this, gave twenty grains of cocaine in solution in a measure-glass to the nurse as a draught for the patient. The initial symptoms are not known, for it was not until nearly an hour had elapsed that the nurse, hearing the patient making some unusual noise, had her attention drawn to him. At this time there was coma, out of which the patient could be partially aroused with convulsive movements of the limbs. At the autopsy the brain was found intensely congested, with serous effusion beneath the arachnoid. It was also noted that there was extensive tubercular disease of the kidney and bladder, as well as in the lungs.

HEMORRHAGE FROM SALICYLIC ACID.

AS long ago as 1886 and 1887, Dr. Lauriston E. Shaw, Medical Register to Guy's Hospital, recorded cases to show the influence of the salicylate of sodium in the production of hemorrhage during the treatment

of acute rheumatism. These cases were one of renal hemorrhage and two of hæmaturia. In the London *Lancet* for January 19, 1889, he further quotes two instances in which very distinct hemorrhage occurred from the gums in rheumatic patients treated by the salicylates. We do not think in America that it is generally recognized that the salicylic acid and its preparations have a tendency to produce hemorrhages; but Dr. Shaw affirms that the occurrence of epistaxis during salicylation is mentioned by nearly all writers on the subject, and was freely accepted at the discussion by the London Clinical Society in 1881. Of one hundred and seventy-four patients treated in Guy's Hospital by these drugs, the records show that six per cent. were recorded to have had hemorrhages. The author further affirms that, after having seen so many cases, he has never seen epistaxis occur until the deafness, headache, vomiting, tinnitus aurium, and irregular slow pulse have been well pronounced as the result of very large doses. We think in this country that it is very rare for the salicylates to be exhibited to the extent of causing irregularity of the pulse. Certainly we never saw such a thing. Possibly this is the reason why hemorrhage has never occurred under our observation, and we would very much like if some of our readers would give information as to its occurrence in their experience. In judging of the frequency of such a symptom from published reports, it must be remembered that the man who has seen it and who believes in its existence writes, but that he who has never seen it, and possibly believes that there is no possible relation between the recorded hemorrhage and the drug alleged to be the cause of it, is almost sure to not put his views forth on paper. The negative rather than the positive side of any such therapeutic or pathological study is always much more positively represented in journals.

THE NARCOTIC PROPERTIES OF ESCHSCHOLTZIA CALIFORNICA.

IN our last issue we referred to the claim advanced by Messrs Bardet and Adrian as to the narcotic properties of the *Eschscholtzia Californica*. These authors, it will be remembered, claim that they have succeeded in extracting a glucoside, an organic base, and a small quantity of morphine, from this plant. In the *Gazette Médicale de Paris* for February 2, 1889, is an account of some experiments made by Dr. Ter-Zakariant, in the service of Dujardin-Beaumĕtz, with a watery and an alcoholic extract of this plant. The alcoholic extract is soluble in alcohol, with the exception of the resin soluble in water, but very slightly soluble in glycerin, and insoluble in alcohol and ether. It has a strong, agreeable odor, and a very bitter taste. From an attempt to determine the physiological action of this extract, the author has found that a few minutes after the administration of this substance the respiratory movements increase, and are then gradually reduced, until death takes place. In small doses it has no marked action on the temperature, while in large doses it increases or decreases the temperature, according as it is administered, pure or free from resin. Finally, in small doses, its action on the nervous system appears to be confined to the arrest of the cerebral functions. The animal loses all power, the voluntary movements are entirely suppressed, and the animals are entirely indifferent to all external stimuli. The functions of the spinal cord and the medulla are only affected by large doses,—the motor nerves are first affected, and the sensory nerves only some time afterwards. It is evident that this very incomplete account of the action of this plant adds but little to our knowledge of the properties possessed by this drug, further than the fact that it evidently contains some principle which is worthy of isolation. The experiments made to determine its therapeutic properties appear to show that it is a narcotic of considerable activity and apparently harmless. The dose employed of the alcoholic or watery extract is from thirty to one hundred and fifty grains a day. We trust that further experiments will be made to determine, in the first place, whether this plant does actually contain morphine; and, second, if that be not the case, as to what ingredient its activity is due; while it is evident that if it possesses any value whatever, it must be subjected to much more study before its properties may be applied in therapeutics.

IODIDE OF POTASSIUM IN SYPHILIS.

WE feel somewhat inclined to apologize to our readers for occupying so much space as is given in this number to the subject of iodide of potassium; and, when we agreed to receive the letters, had no idea that they would be so long. The subject is, however, a very important one, and the writers of

the letters are men of experience and renown. So possibly we have not overleaped the boundaries, and, in any case, the discussion is now closed.

Reports on Therapeutic Progress.

PRIMARY UNION AFTER EXCISION OF TUBERCULAR HIP-JOINTS.

At the meeting of the Royal Medical and Chirurgical Society, held December 11, 1888, MR. ARTHUR E. BARKER read a paper with the above title, emphasizing certain conclusions put forward by him in his Hunterian Lectures at the Royal College of Surgeons last summer (*British Medical Journal*, December 15, 1888).

Briefly stated, these were as follows: 1. That scrofulous or, in other words, tubercular joint-disease was a local expression of infection of the tissues with the bacillus tuberculosis, and ran, as a rule, a course beginning in hyperplasia and ending in fatty degeneration. 2. That at a certain stage of the disease the *complete* removal of the infected tissues ought to be possible. 3. That if complete removal of the tubercular tissue from the hip were accomplished, the resulting wound ought to heal in many instances by first intention throughout, as in the case of the knee, and often even without any necessity for drainage. The great advantages which would flow from such primary union after excision were then briefly discussed. The author then described his first case operated upon after the above propositions were made last June, and showed that they were justified by the result. The patient was a boy, aged 5 years, who had been under careful treatment for a year for hip-disease, which resulted in destruction of the head of the femur, and the formation of an abscess of the usual kind. After operation on the lines indicated, primary union took place without drainage under one dressing, and the patient left hospital on the fourteenth day wearing a double Thomas's splint. The latter was removed in the eighth week after operation, and the child went to the seaside, when he began at once to run about, and has been quite well ever since. Other cases were alluded to in which Mr. Pollard had since obtained similar results as regarded primary union by operating on the same principle.

MR. BILTON POLLARD, in reading his paper, drew attention to the fact that the wounds necessary for the extirpation of tubercle from joints would heal as rapidly and as permanently as other wounds of a similar size if certain essential conditions were secured: 1, the whole of the tubercular growth must be removed; 2, perfect asepsis must be assured; 3, bleeding must be checked, and the wound made as dry as possible; 4, oozing must be checked by the even elastic support of a wool dressing and a moderately tight bandage; 5, absolute rest of the part must be maintained during the process of healing. The hip joint was selected for illustration of the views advanced because the author thought that, of all excised joints, the hip had been found the slowest to heal. Four cases of advanced hip-joint disease with caseous abscesses were referred to. Three were operated upon by the anterior incision, and the fourth by a curved incision round the upper and posterior part of the trochanter. Drainage-tubes were not employed in any of the cases. The dressings were changed on the seventh day after the operations, and the wounds were found to have healed by first intention throughout. With the exception of one case in which the acetabulum was perforated, there had been no recurrence of the disease. It was hoped that three of these cases might be brought to the meeting for inspection by the Fellows of the Society.

MR. HOWARD MARSH had been glad to hear that Mr. Barker's case was in the anteroom, and requested that if possible it might be shown to the Society. The little boy then walked in with a considerable limp and some adduction of the leg which had been operated upon.

MR. BARKER explained that he had had a fall lately, and had bruised his knee, which accounted in part for the limp; and also that his splint had been discontinued too early when he was no longer under his own observation; and further, that he was not wearing any high-heeled boot.

MR. CROFT congratulated the authors of the papers most heartily. The success of this treatment might fairly be said to mark an epoch in the surgery of disease of the hip-joint. He could easily remember the condition of treatment seventeen or eighteen years ago, when it was what we should now think deplorable. No operations were then performed until the last stage, and the results were very disappointing to the operating surgeons. In 1880 he had brought a paper before the Clinical Society, treating of forty-five cases, in which he had excised the hip-

joint, and the mortality in those cases was thirty-five per cent. General opinion then was decidedly against early excision. A committee of the Clinical Society was appointed, and reported that it was undesirable to excise the joint unless there was dislocation or a sinus, unless, in fact, the disease was in the last stage. He had continued his practice of early excision, and since then had had fifty-three operations, with a death-rate of only fifteen per cent. That, at all events, was a great gain. When he saw the cases before them to-night he felt ashamed that there should have been so many as fifteen per cent. Of these fifty-three cases, one had been cured within a month, ten within six months, eighteen within a year, and twenty-seven within two years. So far he had been able to make himself certain, and that he considered a very great progress. He envied the authors of the papers, who were able to speak of curing their cases in weeks instead of months; that the wound should be healed in a week would have been an astounding point in practice not long ago. Eight years ago it was a question whether to excise at all. He congratulated English surgeons in recognizing that there was such a thing as tubercular disease which could be cured. He had not himself used the anterior incision, the deep sutures, and various other modern improvements.

MR. BRYANT did not think he could accept Mr. Croft's conclusion that there must be operation in hip-disease at an early stage. More evidence was wanted before that could be decided. The cases that had been shown them were excellent evidence as far as they went, but, of course, the end of these cases had not come yet. He should have been glad to have seen the joints that had been removed, for they must not forget that joints may be repaired; they might have healed without an operation. He was quite ready to admit that there actually was mischief that nature could not heal; in the case in which a sequestrum of bone had been extracted there was certainly need for an operation. He wished to leave out of account all question of whether there was tubercle or not, and then it was the degree of disorganization that determined the operation. He was still in favor of expectant treatment in the great bulk of cases. Of course, if early excisions were compared with an equal number of late excisions, it would be *a priori* probable that there would be more recoveries among the early cases. He would remind Mr. Croft that the cases collected by the committee of the Clinical Society in 1880, which gave a death-rate of thirty-five per cent., were taken from all the hospitals in London, and at a time when the whole knowledge of the treatment of wounds was very different. He could hardly think Mr. Barker would have wished that his patient should have left off using a splint so soon as eight weeks after the operation. As they had seen, a considerable deformity had resulted from it. It would have been better that he should keep it on for a year. Mr. Pollard had his cases on splints, and he had no doubt would keep them there.

MR. HULKE felt he ought to begin by congratulating Mr. Barker and Mr. Pollard on the results of their treatment. Still, many cases, if treated with rest in the early stage, would recover without excision, and when they had recovered in that way gained stronger limbs, were more fit for work than cases of excision. When cases of hip-joint disease were spoken of as healing in a few weeks, he supposed the external wound was all that could be referred to; there would be no complete bony union. In his own cases the mortality had never stood as high as at thirty per cent., and did not now reach fifteen per cent. He had never been in the habit of cutting off the great trochanter, as he was surprised to learn had been the custom with some operators. He was pleased to hear that Mr. Pollard and Mr. Barker were able to get out the synovial membrane through a post-anterior incision, for he should have thought it quite impossible, considering its many folds and recesses. They had heard at a recent meeting how difficult it had been in arthrectomy of the knee when the joint had been laid freely open, and he should have expected it to be much more difficult in the case of the hip. The operation by anterior incision was no new thing; it was introduced by Hüter, who combined it with a drainage-tube at the back of the joint.

MR. HOWARD MARSH had never seen such good results as the cases they had before them. If they turned back eight or ten years, the operations on the hip-joint were certainly of a much rougher type than at present. His usual method had been by posterior incision, but he thought from these cases that an anterior incision would be better. The operations were not quite new; they had all seen a tubercular joint heal quickly after incision. He had treated a knee by excision, and left the wound untouched for a week, and found it then completely healed. Mr. Barker's case was to him disappointing, for the deformity

was considerable. The most important question of all was not the best way of obtaining primary union, but the ultimate conditions of the limb; and the difficult point to decide was what condition could be reached by long rest at first and good nutrition, as compared with early excision, and it must be remembered that some evidence was accumulating against the permanence of tubercular disease.

Mr. Croft begged to be allowed to remark, *à propos* of what Mr. Hulke had said, that when he admitted a mortality of fifteen per cent. in fifty-two patients on whom he had operated, he did not mean that these deaths had been in consequence of the operation; with one exception, in fact, they had been all due to tubercular disease at some time subsequent, and not consequent on the operation.

Mr. C. B. Keetley remarked that after he had excised a diseased hip-joint and scraped out the morbid surrounding tissues, the case had done very well for six weeks, but after that, had died suddenly from tubercular meningitis, and he had thus had an opportunity of examining the joint, and found the head of the femur firmly joined to the acetabulum, and hardly any trace of cicatricial tissue left. The use of the drainage-tube had not been thoroughly discussed, it had been treated as a thing to be avoided, if possible. He regarded it himself as a safeguard against the mistakes in antiseptic treatment into which it was always conceivable that they might fall. If all the morbid tissues had not been removed, there would be use for the drainage-tube in lessening the chance of self-infection. It did not in the least prevent early convalescence; cases might be up and going about in a fortnight on crutches without being the least the worse for a drainage-tube.

Mr. Hulke would be obliged if Mr. Barker in his reply would tell them in more detail how he had found it profitable to fill such a large cavity as was left after excision of the hip with an emulsion of such a strong poison as iodoform.

Mr. G. A. Wright, on being invited by the President to speak, said that he had had considerable opportunities for watching the results of hip-disease among the tuberculous population of Manchester. Out of the last eight hundred cases he had seen, he had performed excision in one hundred and thirty-five. He agreed that the best results would be obtained from rest if the cases were taken in time; but that qualifying clause made the maxim unpractical. He had never seen better cases than what had been shown him that evening. He used drainage-tubes himself, and did not get the operation wounds healed so quickly. In these the section of the bone had been above the trochanter; he thought that no better than section through it. The great difficulty was the entire removal of the morbid tissues. He had found it practically impossible either by the anterior incision, which he had used occasionally, or by the posterior. Only little foci of disease might be left, but they were apt to suppurate when some fall or accident to the child gave them an opportunity. The cases Mr. Barker and Mr. Pollard had shown could hardly be called early cases. The difficult point to decide was whether, in cases of this sort, the children could stand the long waste of getting well without the surgeon's knife. He was accustomed, even after excision, to keep on a Thomas's splint for a year, for without it they were liable to many dangers.

Mr. G. H. Makins related his experience in Halle in 1879, when Volkmann was performing many excisions in early cases of tubercular hip-joint disease. He removed the synovial membrane most carefully, and used a weight after the operation, but no splint. Many of the cases hopped about the wards in three weeks, supporting themselves on a little truck in front of them, and at first seemed to be healing very well. In 1887, however, the practice was given up, for the ultimate results had been unsatisfactory.

Mr. Barker thanked the Society for the kind way in which they had received his paper, but could not claim competence to answer all the questions that had been raised. In the matter before them they were all to some extent in the position of learners. The first question was, What was early hip-disease? He was in the same position as every one else in not wishing to excise the joint until he had given up hope of curing it otherwise. This test case that he had brought forward had had rest to begin with for a year. Before the operation abscesses near the joint had been aspirated, and when the joint was finally laid open it was in advanced disease, and the head of the bone carious throughout. Still he thought the child was better for the operation. He was in favor of using a Thomas splint for months after the operation, as long, in fact, as he could. In this boy's case it had been a mistake of his parents to leave it off;

still it made the case, perhaps, more interesting, and he hoped to get his leg right again, but it certainly was not the treatment he advocated. In answer to Mr. Hulke, he remarked that the cavity left after an operation by anterior incision was a very small one, and he agreed that the iodoform emulsion should be used in small quantity. In order to avoid strong germicides in children he had used an abundance of hot water, and only a little iodoform.

MR. BILTON POLLARD felt he had to return thanks to all who had spoken, and especially to Mr. Wright, who had expressed what he had to say himself. He considered the cases he had shown as rather of late than early disease, since there had been carious bone and abscesses just going to break through the skin. He agreed with Mr. Barker that there was very little cavity left after excision by this plan, for it was filled up by the soft tissues.

A NEW ANTIDOTE FOR MORPHINE.

In the *Internationale Klinische Rundschau* for January 27, 1889, PROFESSOR ARPAD BOKAI recommends picrotoxine as an antidote for morphine, on the ground that it exerts an antagonistic action to morphine on the respiratory centres; for, while morphine tends to paralyze these centres, picrotoxine exerts a powerful stimulating effect. Since, therefore, death in morphine poisoning is usually attributable to paralysis of the respiratory centre, on this ground alone picrotoxine should be indicated as a valuable antidote. Further, morphine may produce such rapid reduction in blood-pressure as to endanger life; while picrotoxine, on the other hand, is a powerful stimulant to the vaso-motor centre, and is in this respect also an antagonistic to morphine. Professor Bokai adds that the action of morphine on the cerebrum is directly opposed to that exerted by picrotoxine. Finally, Professor Bokai suggests that the previous administration of a small dose of picrotoxine might reduce the danger of asphyxia in chloroform narcosis.

CITRATE OF CAFFEINE IN ECLAMPSIA.

MR. BOLTON CORNEY divides cases of puerperal eclampsia into those in which the affection is due to the retention in the blood of excretory matters through defective action of the kidneys, and those which appear to arise independently of such a cause. In the latter class of cases he maintains that caffeine is especially valuable, and he reports the following remarkable case, which certainly appears to substantiate his claims (*Practitioner*, February, 1889):

Mrs. S., a married lady, 23 years of age, gave birth to an undersized but full-time child at 7 A.M. on August 21, after an easy labor of only three hours' duration. The placenta, etc., came away as usual.

August 21.—There was some distress from after-pains, and about noon the patient began to complain of headache, which became worse. At 9 P.M. she vomited often, and at 11 P.M. she became violently convulsed, as in epilepsy, with total loss of consciousness. The fits continued, with short remissions and intermissions, for ten hours, during which half an ounce of potassium bromide, a quarter of a fluidounce of tincture of hyoscyamus, and forty grains of chloral hydrate were administered by the practitioner in attendance. A few whiffs of chloroform vapor were also given.

There was no œdema of face or feet, the urine contained no albumen, and there had been no signs whatever of kidney-disease or of temporary derangement of the renal function. The patient remained in a deep stupor for three nights and the two intervening days. She continued to swallow readily all food, drink, or medicine which was placed upon her tongue. The bladder became paralyzed, and the urine dribbled all the time. The lochial discharge was very scanty and glutinous. The temperature maintained an even figure,—101.5° F., but the pulse showed remarkable fluctuations between 80 and 132 in the complete minute, and there were periods of cyanosis. Respiration was for the most part at the rate of 30 per minute, but occasionally more. Although the trachea was from the first very noticeably obstructed with mucus, the patient never once coughed, and therefore did not clear it. It was not of such amount as to cause cyanosis or any embarrassment in breathing. Some other reflexes were inactive, but the act of swallowing remained perfect throughout, although consciousness was entirely absent. Beef-tea, milk, white of egg, and now and then a teaspoonful of brandy, were given at brief intervals.

Matters became worse, and the continued and complete stupor became hourly more alarming. In the afternoon of the 23d the case appeared to the patient's relatives and friends hopeless. The left arm and leg w

paralyzed, and the right fingers and hand were picking at the bed-clothes. There was partial unilateral ptosis, and drooping of the corner of the mouth, causing a blowing respiration through the gap. Teeth and tongue were dry and covered with black sordes. Pupils were insensible, equal, conjunctivæ and corneæ glazed with a death-like, glairy mucus; the gaze fixed; the beads of clammy perspiration were on the forehead, lips, and wrists. Bowels refused to act, even after turpentine enemata. Urine dribbled all the time, and was a source of much discomfort and danger. Pulse, 110; breathing, 32 to 36; temperature, still at 101.5° F. The heart fluttered; lividity occurred more often and lasted longer. At this stage of the case three grains of citrate of caffeine, with two and a half grains of sodium salicylate in distilled water were injected subcutaneously. This was followed in an hour by 6 grains more given by the mouth, and 2 grains every two hours afterwards for six doses. Some general improvement took place, the pulse improved, and the attacks of lividity ceased. The paralytic symptoms diminished in degree, and towards dawn on the 24th signs of returning consciousness were observed.

August 24.—At 10 A.M. the pulse had fallen to 82, and was firm and full, and respiration was at the rate of 26. The pupils had regained some sensibility, but the temperature remained the same,—101.5°. The lochia, however, were becoming very deficient, and warm vaginal douches of carbolized water were given every hour. The genitalia were sponged with a stronger lotion, and the whole body was washed with the same.

The caffeine was suspended.

At 3 P.M. there was another attack of imperfect aëration, with lividity; the patient seemed to be losing ground again, the respiration had risen to 32, and the (thready) pulse to 110. Resuming the caffeine, 2½ grains every two hours.

August 25.—1 A.M., consciousness returning. Eyes open and clear. General improvement. Skin hot and dry, however. 6 A.M., is undoubtedly awake, though her mind seems a void. Answers "yes" and "no," but with some hesitation. Lochia ceased, but nurse omitted to report it. 5 P.M., skin very dry and hot, face flushed. Frequently places hand over pubes, as if in pain there. Breathing, 36. Trachea now free from mucus; patient able to cough. Pulse, 110; temperature, 103.8° F. Nurse admits that lochia ceased this morning. Hot fomentations. Quinine, 15 grains, statim.

August 25 to 26, midnight.—Now much more awake. Speaks whole sentences, but is confused, and has entirely lost memory. Picks at buttons or anything bright within reach. Very hot and flushed. Temperature, 104.2° F.; pulse, 130. Repeat quinine, 15 grains. Continue fomentations and sponging. Discontinue caffeine.

August 26.—The lochial discharge returned in the morning, and was of more normal character than it had ever been. The symptoms relating to it were all ameliorated, the temperature fell in a few hours to 98.1° and the pulse to 88. From this time the patient made a steady recovery, and a week later the only remaining abnormities were a certain degree of muscular weakness and debility, with the usual singular blankness of memory for recent events, including not only the labor and its concomitants, but the occurrences of the previous two or three months.

A HITHERTO UNDESCRIBED CAUSE OF DELAY IN THE SECOND STAGE OF LABOR.

At the recent meeting of the Buffalo Obstetrical Society, Dr. A. H. BRIGGS read a paper with the above title. (*Buffalo Medical and Surgical Journal*, February, 1889.) This subject was suggested to him by observations at the bedside. In the divisions of the stages of labor, he gave the second stage as the period from complete dilatation of the os to final delivery. In anatomical studies of the uterus, it had been observed that its circular structure was composed of two kinds of fibres, viz.: circular and longitudinal. The longitudinal fibres belonged to the upper portion of the womb, while in the cervix they were more circular, the two being somewhat interblended.

The phenomena of dilatation consisted in the drawing back of the circular fibres by the longitudinal ones, not alone from the expulsive pressure of the uterine contents, but from contraction of the muscular fibres of the womb, due to the muscular action named. Taking that for granted, one could easily see why dilatation occurs without much pressure of the head. In some cases as the edges grow thinner, they grasp the head like a band or cord, and finally can be felt sliding over it. This produces an agonizing pain, just at the moment the os slips over the head; then there is repose, so far as active contractions of the

uterus are concerned, and the patient, too, is quiet.

The speaker called particular attention to the part the longitudinal fibres play at this time. He believed that in many cases of primiparæ, the os grasped the neck just at this period of labor, holding it tightly, which was one cause of delayed second stage.

When watching for the advance of labor at this time, he had been struck with the great delay, notwithstanding active pains, as well as other evidences of apparently progressive labor.

In relating a case where he had met substantially this difficulty, he had gone to fetch his forceps, but, on returning, he found the woman had delivered herself. He had not observed this phenomenon stated in the literature of the subject as a cause of delay in this stage of labor, but was convinced from his observations that it was to be regarded as a factor in, or cause of, delay many times.

THE TREATMENT OF SUFFOCATIVE ATTACKS AFTER TRACHEOTOMY FOR CROUP.

Pieniazek has sought for some years to diminish the large mortality after tracheotomy, and used for some time, and with considerable success, an elastic catheter followed by aspiration. The catheter seemed to owe part of its success to its irritation of the tracheal walls, whereby a violent and effectual cough was set up. The method succeeded for the first or second severe attack, but, after that, as a rule, the stenosis reached the bronchi and it of course failed. In September, 1882, he first tried another method upon a female child, aged 2 years. The patient being so young, and the trachea consequently so small, but little benefit was likely to be derived from the catheter treatment; moreover, its insertion might cause complete obstruction and suffocation. The author, after tracheotomy had been performed, remained within call, and when the first fit of suffocation (which was very severe) occurred, he removed the canula and first attempted to aspirate through the catheter; but, as this did not succeed and the child's condition began to be critical, he introduced a pair of Schrötter's laryngeal forceps, with the blades placed antero-posteriorly so as to avoid catching hold of the trachea at its bifurcation, and succeeded in bringing out a knuckle of pseudo-membrane. Artificial respiration followed, and the patient soon breathed freely. During the next three days four other attacks were similarly and successfully treated, the membrane being first pushed down with the catheter and afterwards seized and removed with the forceps. One of these membranes was a complete cast of the lower part of the trachea with the three principal branches of the right and left bronchi.

The treatment of the sixth attack, however, failed. The removal of the membrane was followed by free vesicular breathing all over the right lung, but over the left nothing was audible. Two hours later the child died quietly, with symptoms not of stenosis, but of collapse.

The next case was that of a boy, aged 7, in whom, twelve hours after tracheotomy, a violent suffocative attack occurred. The catheter and forceps were, however, successfully used. After that about four attacks took place daily, but these were treated before the symptoms became so acute, and often without the preliminary aspiration, as this was, as a rule, inadequate to remove the membrane. The attacks continued, but with diminished frequency, up to the third week, and the later ones were treated at once with the forceps; this instrument, instead of the catheter, being used to force down the membranes. Later still, it was found that the trachea was free, and that the obstruction was exclusively in the bronchi. The author then lightly curved the forceps, and by sense of touch, together with observation of the length and the direction of the curve of the instrument, succeeded in passing it into one or other bronchus. At the end of three weeks the attacks ceased, and at the end of five the child was removed.

In another case—that of a child, 2 years old—there was a considerable degree of stenosis after the operation, and its seat was made out to be under the canula. The author was anxious to see it, in order to determine its nature, and for this purpose, after several failures, he took a large ear-speculum, pushed it into the wound, bent the patient's head as far back as possible, and pressed the head of the speculum towards the spine, so that the smaller end pointed to the bifurcation of the trachea. On throwing light from a reflector, the stenosed portion was plainly visible, and was seen to be due to growths upon the hinder and lateral walls; after failing to remove them blindly, a pair of laryngeal-polypus forceps was introduced through the speculum and two of them were pinched off, the remainder being treated with the gal-

vanic cautery. The operation was not easy, as the instrument shut out nearly all the view, but the difficulty of determining how deep to go was got over by measuring the distance first with a sound and marking it off on the forceps. The operation had, however, to be repeated more than once.

To reach the false membrane and dry masses in the bronchi and their principal divisions, Dr. Pieniazek has had an instrument like a very long blunt ear-spoon made. This was first used in a boy, aged 5 years, and though death appeared imminent he recovered. The spoon is of especial advantage in the case of the secondary bronchi, the walls of which are so thin that it is difficult to avoid seizing them with the forceps. The symptoms of stenosis in this situation were such as to be readily confounded with those of adynamia, for the breathing was superficial and there was no stridor; auscultation, however, always gave localized absence of vesicular murmur. During the year 1887 the author lost seven out of twenty tracheotomy cases,—namely, two of erysipelas, two of adynamia, one of pneumonia, one of bronchostenosis (which it was found impossible to relieve), and one was already dead in a suffocative attack when reached. In conclusion, the author enjoins that these methods should not be resorted to unless either danger is imminent or milder measures have failed.—*The London Medical Recorder*, January 21, 1889.

THE THERAPEUTIC ACTION OF HYOSCINE.

In the *Therapeutische Monatshefte* for January, 1889, Dr. Kny, of Strasburg, reports the results of the administration of the muriate of hyoscine in subcutaneous injections in eighty-eight different cases occurring in the Strasburg clinic for nervous disease. In 82.2 per cent. the result was successful, sleep lasting from six to eight hours occurring within an hour after the administration of the dose. The majority of failures occurred in cases where the insomnia was not accompanied by any motor disturbances; while, on the other hand, where there were marked motor symptoms, as in mania and paralysis, the result was the most favorable. The dose was from $\frac{1}{111}$ to $\frac{1}{74}$ gr., although sometimes the dose had to be increased on account of the patient becoming accustomed to the drug. One-twentieth of a grain a day was the largest amount ever given. Disagreeable after-effects were seldom observed, and these consisted of dryness of the throat and thirst. Heart-disease does not appear to be a contra-indication for its use, since it was used in a case of aortic insufficiency with good result. Tastelessness, ready solubility, and cheapness are special recommendations for the drug. Dr. Kny gives the preference to hyoscine for a hypnotic in case of great excitement; while sulphonal is preferable in cases of insomnia not so accompanied by motor disturbances. In paralysis agitans and multiple sclerosis hyoscine proved to be a palliative remedy.

THE TREATMENT OF CARDIAC DILATATION.

At the eighty-third annual meeting of the Medical Society of the State of New York, recently held in Albany, Dr. A. L. Loomis, of New York, read a paper on the Management of Cardiac Dilatation based on its Etiology, of which the following is an abstract. (*Medical Record*, February 9, 1889.) Cardiac murmurs were now regarded as of significance according to the pathological lesions and functional disturbances which they attended.

When the circulatory system became disturbed by disease within, or aside from, the heart, there was tendency to compensating hypertrophy. To maintain such hypertrophy of the heart certain conditions must be complied with: (1) the muscular tissue of the heart must be healthy; (2) the heart-muscle must receive sufficient supply of healthy arterial blood; (3) waste products must be rapidly removed from the body; (4) the nerves of the heart must be in normal state. Any changes of these conditions led to weakening of the heart-muscle and favored dilatation.

In studying the etiology of cardiac dilatation, cases divided themselves naturally into two classes,—primary and secondary. The primary causes were (1) impaired nutrition with extreme anæmia, as in those subject to excessive physical labor; (2) degenerative changes in the heart-muscle; (3) excessive use of narcotics, as tobacco, alcohol, excessive venery. Secondary causes were insufficiency of aortic and mitral valves, obstruction to aortic circulation, atheromatous changes in nutritive artery of the heart, arterial sclerosis, and renal disease. It was always important, from a therapeutic stand-point, to determine whether dilatation was or was not secondary to hypertrophy, for the chances of temporary or permanent relief were greatly diminished if it were secondary to hypertrophy. Dilatation from impaired nutrition,

most common in hard-working men, should be treated by rest, diet (mostly animal food), moderate physical exercise. He had obtained benefit from only one drug, arsenic in $\frac{1}{60}$-grain doses after meals. In dilatation after typhoid fever, and other acute infectious diseases, the patient should not be allowed to rise from bed; give suitable food, wine; give combination of quinine and strychnine. Attention to functions of stomach and liver. Small doses of calomel, combined with rhubarb and soda, diet, and rest, often did more to relieve symptoms than tonics. Iron, arsenic, and strychnine were the most useful tonics in cases of dilatation from fatty degeneration.

The general management of dilatation due to fibroid degenerations of the heart-muscle was similar to that in fatty degeneration. Bichloride of mercury was administered in $\frac{1}{16}$-grain doses for a long period; so-called cardiac tonics to be avoided; maintain action of the kidneys. Dilatation in those addicted to excesses with tobacco, venery, etc.; remove the exciting cause; use of strychnine and shower-bath; bromide of potassium in cases of excessive venery.

In secondary dilatation the condition was more serious. The heart-muscle should be kept as healthy as possible by diet and general habit; when compensation was incomplete digitalis was demanded. Digitalis was safely administered when pulse was of high tension, and its use was followed by increased urinary secretion. Some of the indications for convallaria, strophanthus, etc., were pointed out.

A NEW OPERATIVE TREATMENT IN EMPYEMA.

The treatment of empyema offers great difficulties when the lung is completely collapsed as the result of long compression by a purulent effusion. In such cases since 1879, Estlander and others have advocated the resection of large portions of the ribs with opening of the thoracic cavity. Schede, modifying this operation, removes not only the rib, but also its periosteum and subjacent pleura,—that is to say, he takes away the inner chest-wall, with the exception of the skin. Sprengel has introduced still another modification by making a subperiosteal resection of two ribs throughout almost their entire length, and then opening the pleura, and washing out the pleural cavity. This procedure, according to its introducer, has given excellent results where other means have proven unsuccessful. Professor Saubbotine (*Gazette Hebdomadaire des Sciences Médicales*, January 26, 1889) thinks that the methods of Estlander and Schede are accompanied by great dangers from the fact that they leave a large denuded surface constantly bathed in pus, and may readily so lead to blood-poisoning. He thus has endeavored to preserve the surface of the wound from this contact. He starts with the idea that, to cure an empyema with complete collapse of the lung, it is unnecessary to remove the ribs, but that it is quite sufficient to perform on them a subperiosteal section. A rib being incised in two points, it is only necessary to exert pressure on the middle segment to reverse entirely the normal convexity of the rib, thus diminishing the cavity of the pleural sac. The following is his operative measure: The patient being anæsthetized, the skin is divided horizontally along the seventh rib, which is freed from its periosteum for a space from two to four inches in length. The pleura is then opened and the purulent contents evacuated and washed out with some antiseptic liquid. After that the wound is closed and sealed. An incision is then made along the border of the great pectoral muscle, and through this incision the fourth, fifth, and sixth ribs are divided, and a small place resected so as to make them pliable. A similar incision is then made in the subaxillary line and the same ribs are again divided. The two vertical incisions are then closed by sutures and then covered with antiseptic dressing. If the antiseptic precautions have been carefully observed, the wounds made in resecting the ribs heal by first intention.

The advantages of this operation over that of Estlander's are the following:

First, the costal wounds, if the necessary precautions have been taken, do not come in contact with the pus, and heal like simple fractures or subcutaneous osteotomies.

Second, the divided ribs becoming flexed greatly reduce the volume of the pleural cavity, and, consolidating later in this position, they furnish a sufficient support to the vertebral column, thus diminishing the tendency to deformity of the latter.

A HITHERTO UNOBSERVED EFFECT OF THE SALICYLATES.

Among the effects produced by the members of the salicyl group upon the nervous system, mydriasis has been noticed in association with the amblyopia frequently caused by the action of these drugs; but, so far as

we know, myosis has not been observed as a result of their administration. In a case reported in the *Practitioner* for January, 1889, by Drs. G. A. Gibson and R. W. Felkin, extreme contraction of the pupil was caused by the use of large doses of salicylate of sodium. The patient in this case was a lady of middle age, who fell ill on the evening of November 9. When she was first seen, early next morning, she complained of severe pains in the head and limbs, and the temperature was found to be 105.8° F., while the pulse was 104. In spite of the want of correspondence between the temperature and the pulse, it seemed probable that the condition was rheumatic in its nature, and the patient was ordered 20 grains of sodium salicylate every two hours. In the afternoon of the same day the pupils were found to be greatly contracted, and their reaction to light was absolutely lost, while the vision was distinctly impaired. Tinnitus aurium and deafness were also present, and were accompanied by severe headache, chiefly experienced over the occipital and parietal regions. The subsequent history of the case is of no importance in this connection. All that is necessary to mention is, that on the following day phlegmonous erysipelas made its appearance on the left leg, in consequence of which, along with the fact that the temperature had fallen to 101° F., the further administration of the sodium salicylate was suspended, and sulpho-carbolate of sodium was substituted for it at a later period of the day. On the following morning, the pupils, although still somewhat small, reacted to light, and it was found at the evening visit that they had returned to their usual size. About mid-day on November 13 the temperature again began to rise; a dose of salicylate of sodium was given, and repeated two hours later. At the evening visit, about nine o'clock, the pupils were found to be once more contracted, and to have lost their normal reaction. The effect had disappeared before the next morning. The patient made an excellent recovery. The myosis and loss of reaction to light appeared within eight hours of the commencement of the employment of the salicylate of sodium, and did not entirely pass away until thirty hours had elapsed from the time of its last administration.

RADICAL CURE OF HERNIA.

At a recent meeting of the Buffalo Medical and Surgical Association, Dr. Park read a paper on the "Radical Cure of Hernia." (*Buffalo Medical and Surgical Journal*, February, 1889.) After rehearsing the numerous methods of treatment that have been proposed, he took up the modern surgical procedure which has been advocated by various operators. He favored Czerny's method of ligating the sac as high up as possible and excecting the part below the ligature in all cases except congenital herniæ. In these the lower portion is left and closed by suture or ligature, so as to form a tunica vaginalis for the testicle, the part between the ligature being removed. Beginning from below, the pillars of the ring are brought together with wire sutures, leaving a small opening at the bottom for the cord. The author at first made a shoe-lace suture, but found it difficult to get accurate approximation of the pillars of the ring. Catgut was at first used for suturing, but was discarded later for silk. At present he employs silver-wire sutures, a sinus having formed in one of his cases with the throwing off of one of the silk sutures. The incision should be long enough, great care being taken to separate the sac from the cord. Intestines are replaced into the abdomen, and the sac ligated as high up as possible. The silver sutures are twisted, the cut end being turned in and left in place. Femoral and umbilical herniæ are to be similarly treated, extirpation of the sac being essential. "In strangulated hernia, after relieving the strangulation, proceed in the same way. Do not allow the wearing of a truss after the operation." The author has operated in forty cases, uncomplicated by strangulation or otherwise, with universal success. The patients were of all ages, from five years to sixty. Six of the operations were for umbilical, and eight for femoral hernia. In one of the cases of umbilical hernia, a fat woman, in whom the tumor hung down to the thighs, there existed a number of tumors within the sac, together with ulcerations on the surface. Fearing the tumors to be malignant, he had at first declined to operate, but, the patient assuming all risks, he operated, removed the sac and tumors, closing the wound with three layers of sutures, including the (1) peritoneum, (2) the deep and (3) superficial tissues. Adherent pieces of omentum are to be loosened and appendices of the same are to be securely ligated and cut off, especially if they cannot be easily replaced into the abdomen. Dr. Park takes the position that hernia, with its attendant liability to strangulation, is more dangerous to life than the operation for its

cure, and, therefore, recommends it in all cases.

CONTRAINDICATIONS FOR THE USE OF ANTIPYRIN DURING THE MENSTRUAL PERIOD.

Cases of toxic accidents from the use of antipyrin have been frequently reported, but the conditions under which these results are produced have not been sufficiently studied. Without doubt, in some cases, the poisonous effect is to be attributed to the poor quality of the drug, but the condition of the patient also deserves consideration. In the *Revue Générale de Clinique et de Thérapeutique* for January 24, 1889, DR. H. HUCHARD states that a year ago he administered 15 grains of antipyrin to a woman suffering from violent dysmenorrhœa. As the result of the administration of this drug, the menstrual flow was suddenly arrested. The patient was seized with violent chill, chattering of the teeth, the face became cyanosed, and there were frequent attacks of syncope, the pulse was small and weak, and the patient complained of great headache. The condition was such as to cause great anxiety for nearly an hour, when the effects gradually passed off. Dr. Huchard thinks that he has in two other cases observed similar symptoms, although less marked, and he now regards the presence of the catamenial flow as a positive contraindication to the use of antipyrin.

INTRAVASCULAR COAGULATION OF THE BLOOD AS THE RESULT OF DIFFERENT DRUGS.

Starting with the observation that certain substances, for example, lake-colored blood and blood of animals of different species, may produce, according to the amount of the injection, fatal thrombus or fatal hæmoglobinuria, DR. SILBERMANN (*Centralblatt für Klinische Medicin*, January 2, 1889) made a number of experiments as to whether certain substances which as yet are only known to produce hæmoglobinuria might not also produce coagulation of the blood while still in the vessels. It is evident that the determination of this question may perhaps explain the frequent occurrence of thrombus and the production of various morbid symptoms in different forms of poisoning. The author found that sodium chloride, glycerin, toluylendiamin, and pyrogallic acid produce thrombi; while animals in whom the blood of dogs poisoned with sodium chloride was injected, likewise died as the result of general thrombosis. Capillary thrombi were frequently found, and were recognized by the author by injecting indigo-carmine into the veins, and then seeing that certain parts of different organs were protected from the injection with this pigment. Dr. Silbermann also examined in this way the results of arsenic- and phosphorus-poisoning, and raises the question as to whether perhaps clinical symptoms with poisoning with these bodies may be attributable to coagulation of the blood in the smaller vessels by the production of thrombi.

A NEW SYMPTOM OF PERICARDITIS.

In the *Internationale Klinische Rundschau*, February 3, 1889, PROFESSOR VON STOFFELLA described a symptom occurring in pericarditis which appears to have been hitherto overlooked by all writers on this subject, with the exception of Dr. Pins, who has likewise made the same observation, and reported his entirely independent studies before the recent meeting of the Vienna Medical Society.

It is well known, that, on auscultation of the heart, in cases of pericarditis which are accompanied by a percussion-sound, the sound in different cases may either change its locality or its intensity. Thus, for example, a percussion-sound heard in any given point while the patient is in a recumbent position may either increase in intensity or entirely disappear when the patient sits up, and may appear in some entirely distinct place. The ground for change of character and locality of the sound is evidently to be found in the fact that in the change of position different parts of the pericardial surface come in contact. Dr. von Stoffella has found that in the change from the recumbent to the erect position in case of pericarditis there is not only an alteration in the sounds detected by auscultation, but also in the sounds recognized by percussion. He claims that any case where, in the recumbent position, effusion at the base of the heart may be recognized by percussion, when the patient assumes the sitting position the character of the percussion-sound changes completely. This phenomenon the author explains as follows: As is well known, pericardial effusion leads to the production of dulness by compressing the lung and so bringing a greater part of the pericardial surface in contact with the chest-walls. If, then, the pressure exerted by the exudation be reduced, it is evident that the lungs will again expand, and substitute

the resonance of the pulmonary tissue for the dulness of the pericardial effusion. In the recumbent position of the patient, accumulation of fluid in the pericardium exerts a much greater pressure on the lungs than when the patient is in the erect position, for in the latter case the effusion gravitates to the most dependent part of the paricardial sac, and to that extent relieves pressure on the lungs.

CHRONIC HEADACHE.

At the recent meeting of the Medical Society of the State of New York, DR. C. L. DANA, of New York, read a paper entitled "Chronic Headache" (*Medical Record*, February 9, 1889). It was based on a study of two hundred cases of chronic headache, functional in character, excluding migraine. His conclusions were: 1. There should be more general recognition and differentiation of chronic head-pains of functional origin. 2. Pains in the head are either neuralgias, migraines, or so-called headaches. 3. The seat of headaches is always in or referred to the trigeminal, vagus, or four upper cervical nerves. 4. Headaches are seated in or referred to the periphery of the nerves in question; neuralgia is seated in the trunks or central; migraine is a periodical discharging neurosis, affecting motor, vasomotor, secretory, as well as one or more cranial sensory nerves. 5. The dura mater is the most frequent seat of headache. 6. The great headache ages are from eight to twenty-five, and again from thirty-five to forty-five; childhood and old age are exempt. 7. The chronic functional, non-migrainous headaches may be classified as hæmic, including diathetic forms, toxic, dyspeptic, neurotic, reflex.

More exact knowledge of the nature of headaches may be gathered by studying the location and character of the pain in its relation to cause. Neurotic headache is best treated symptomatically by antipyrin, menthol, antifebrin, caffeine, and bromides. Headaches due to reflexes are often treated better constitutionally than by means directed to local conditions. Rheumatic headaches are best treated by ammonia, chloral, and warmth.

THE ANTILITHIC PROPERTIES OF ANTIPYRIN.

In the *Revue Générale de Clinique et de Thérapeutique* for January 24, 1889, H. HUCHARD writes that about a year ago he administered several doses daily of 15 grains of antipyrin for violent renal colic. The result in relieving pain was very striking, so much so that the patient contracted the habit, without advice, of taking two doses of 15 grains each of antipyrin every day. He continued this independent treatment for about six months, and then reported that his pain had entirely disappeared and that there had also been a great change in the renal secretion. The urine was entirely free from sediment, was clear, limpid, and chemical examination showed that it contained but a normal quantity of uric acid. This result was especially surprising, since it is generally acknowledged that antipyrin diminishes renal secretion. Dr. Huchard states that he hardly felt warranted in concluding that the improvement in this case was attributable to the antipyrin until he found a case reported by Schweig which had likewise been relieved not only of the renal colic, but that the renal secretion had been restored to its normal character by the daily administration of 1½ grains three times daily. These two observations are naturally not sufficient to establish the remedial value of antipyrin in the uric acid diathesis, though it seems to warrant further experiments being made with this drug in this connection.

Reviews.

BRIGHT'S DISEASE OF THE KIDNEY. By Alfred L. Loomis, M.D., LL.D., etc.
Detroit, Mich.: Geo. S. Davis, 1888.

The author defines Bright's disease "as a non-suppurative inflammation of the kidney, with manifestations determined by its etiology, the special elements affected, and the inherited tendencies of the patient." The definition strives to do away by its general and comprehensive character with the difficulties surrounding the name unfortunately bestowed upon many rather than one disease. By strict pathological classification the name should, the author thinks, be restricted, as by Virchow's original distinction, to parenchymatous and interstitial nephritis, but from its clinical significance it has become customary to include "the waxy, lardaceous, or amyloid kidney under this head." And the author further remarks, "All pathological changes, except the amyloid, not only may be, but usually are, present in varying proportions in every case of Bright's disease"

The author divides his subject into parenchymatous and interstitial nephritis and amyloid kidney. As throwing light upon the author's views of a vexed question, we quote the following: "Cases of Bright's disease which are chronic from their inception will be found to develop in two classes of subjects,—first, those suffering from the fibroid diathesis, in whom all forms of irritation tend to the induction of fibroid inflammation not only under stimulation which in other individuals would produce only healthy nutritive activity; second, those in whom, either through an inherited or acquired functional weakness of the organs of direct and retrograde metabolism, or on account of intemperance in food or drink, the kidneys are for a long time called upon to eliminate both an excessive quantity of the normal elements of excretion and products of faulty metabolism." By a combination of these two classes we may find "a set of individuals . . . who combine a marked fibroid diathesis with functionally weak liver, heart, and mucous membranes, and for whom we can predicate death from either apoplexy, cardiac failure, or Bright's disease." In such simple and easy language does the author dispose of a troublesome question, shoving the difficulty along by means of such machinery as "fibroid diathesis," "fibroid inflammation," and "faulty metabolism." The difficulty still, however, remains to tempt future investigators.

The question of uræmia the author considers a mixed one, urea retained in the blood being the most important of perhaps many self-generated poisons, the toxic condition being the product of all rather than of any one.

Of albuminuria it is remarked, "Within a comparatively short time albuminuria has ceased to be synonymous with Bright's disease," and pathologists have come to recognize a physiological and pathological albuminuria. Of the subjects of physiological albuminuria, the author says, "Although by far the larger proportion of such cases terminate in recovery . . . I cannot but believe that they show a failure of cellular activity such as must strongly predispose to inflammatory and degenerative changes."

With regard to the question of increased arterial tension and cardiac changes of Bright's disease, the author, after a discussion of the views of Gull and Sutton, Mahomed, and others on the subject, says, "While high arterial tension throughout the body thus becomes the recognized cause of cardiac change, the explanations of its cause and nature are both various and contradictory." The theory of Cohnheim seems to him more satisfactory than any other, and cardiac hypertrophy in connection with Bright's disease, Dr. Loomis insists must be considered as either a necessary consequence, a compensatory process, or a physio-pathological condition connected with the renal disease solely through the sympathetic system.

The discussion of casts, retinal changes, etc., is full. After which the author takes up the special varieties of Bright's disease *seriatim*. The causation of acute Bright's disease the author attributes to sudden changes of temperature rather than cold in itself, especially in those susceptible, and direct local irritation by some foreign element in the blood. On the question of treatment, we read, p. 58, "We thus find several indications presented for consideration in the treatment of acute Bright's disease. The foremost is the relief of the kidney from both functional activity, and the irritation of its normal products of excretion,—viz., acid urine and partially converted elements of retrograde change. The former has received much attention, the latter hardly any, from clinical teachers and theoretical writers." Now, while we have searched diligently in the subsequent pages, we fail to find any new or novel suggestions which will satisfy the author's statement above, from which we had been led to expect some decided therapeutic advance on his part. Mineral waters, digitalis, saline diuretics, milk diet,—these are the means on which he, in common with thousands of other physicians, relies for local relief to the blocked-up and congested kidney.

In the treatment of chronic nephritis, the author believes that the nutritive processes should "be crowded to the utmost." Milk is his reliance, almost to the exclusion of everything else. When predigested "three, four, or more quarts" per day can be taken without excess. Except in cirrhotic disease, when he excepts the bichloride, he condemns mercurials, but begins iron early in the form of tinct. ferri chloridi.

Taken as a whole, Dr. Loomis has given in condensed form an exceedingly useful monograph upon the subject, and one that from its price is easily accessible, and cannot fail to enlarge the views of many upon a subject still in many points in doubt, but unstudied and misunderstood to a degree far beyond its pathological intricacy. E. W. W.

TREATISE ON THE DISEASES OF WOMEN. FOR THE USE OF STUDENTS AND PRACTITIONERS. By Alex. J. C. Skene, M.D., etc. With two hundred and fifty-one engravings and nine chromo-lithographs.
New York: D. Appleton & Co., 1888.

The author aims at bringing together the "fully matured and essential facts in the science and art of gynæcology," and many others seem to be actuated by the same aims. What claim Dr. Skene's book has, and how it compares with its many compeers, we will endeavor to discover.

The author divides the diseases peculiar to women into three classes,—from birth to puberty, from puberty to the menopause, and, thirdly, "those which come after the menopause." "The history of gynæcology, and the discussion of all unsettled questions, have been," thank heaven, "omitted."

The book itself is a credit to the publisher. It is illustrated very fully, and with many entirely new illustrations. The chromo-lithographs, nine in number, are marvels of the art, conveying a better idea of the author's idea than many pages of printed matter. In fact, all the illustrations are decidedly above the average, and some of them wonderfully vivid,—as an example, the very beautiful wood-cut on page 247 illustrating crescentic laceration of the os.

The ground covered by Dr. Skene's book is so essentially that covered by many recent works that an enumeration of its contents seems superfluous. Perhaps the most original matter is to be found in the chapters on "Diseases of the Urinary Organs." Here the author has improved very much on his already published and standard work on that subject, and, although covering in this volume much less space, we cannot but regard these chapters as superior to his previous work as a whole. The author has evidently thought more and experimented more, has had more cases since his work was published, and has improved in his methods of treatment.

The use of the endoscope or cystoscope has in this author's hands proved very useful. Dr. Skene's endoscope is simple in construction, and seems in his hands to have been of considerable service, but he acknowledges that the cystoscope of Nitze and Leiter "is the only instrument for thoroughly investigating the bladder." This he very fully describes, with illustrations, quoting from Dr. Willy Meyer's article in the *N. Y. Med. Journal*, April 21, 1888, at considerable length.

In the chapter on "Organic Diseases of the Bladder," the author gives a very interesting treatise on bladder hemorrhage. In regard to blood-clots, he says, they "should be allowed to remain until they break down and come away of themselves. When actual inability to urinate persists, from the presence of a large coagulum, the author advises a flexible catheter carefully passed through or around the clot with as little disturbance of the clot as possible. The section on "Acute and Chronic Cystitis" is very valuable, and the treatment recommended by the author is sound. In fact, the really important part of the work is comprised in the section on "Diseases of the Urinary Organs," occupying over three hundred pages. Here the author is completely at home with his favorite subject, and has given us reason for saying that his treatise on the diseases of women possesses some peculiar claim to the favor of the medical world. E. W. W.

ELEMENTS OF PRACTICAL MEDICINE. By Alfred H. Carter, M.D., London, etc. Fifth edition.
London: H. K. Lewis, 136 Gower Street, W. C., 1888.

This is one of those condensations which owes its being to the demands of the student, and affords a means of more rapidly acquiring that kind of knowledge which suffices in technical examinations. These over, and its work may be considered as completed. The bold facts of the subject are all there, without any of the graces of rhetoric to attract the mind and stimulate the memory. Probably there are some to whom this book may be of use after examinations are over, but they must belong to that rare class who read the directory for amusement, and find a mental solace in Webster's dictionary. E. W. W.

SECOND SERIES, PHOTOGRAPHIC ILLUSTRATIONS OF SKIN-DISEASES. By Geo. Henry Fox, A.M., M.D., etc. An atlas and text-book combined. Complete in twelve parts. Hand-colored plates. Nearly one hundred cases from life. Parts I. to VI.

These extremely valuable plates have now reached the sixth number, and continue to display the same high standard of artistic excellence. The parts already published cover, with the associated text, seborrhœa, erythema, varicella, and variola, urticaria, the different forms of dermatitis, eczema, sycosis, psoriasis, lichen, pityriasis, and herpes. To the many who are unable to pursue the subject of skin-diseases in any other way, they will prove invaluable, and will enable any careful observer after their study to diagnose cases with almost as much readiness as from the actual observation of many cases in real life.
E. W. W.

HANDBOOK OF MATERIA MEDICA, PHARMACY, AND THERAPEUTICS. COMPILED FOR THE USE OF STUDENTS PREPARING FOR EXAMINATION. By Cuthbert Bowen, M.D., B.A., editor of "Notes on Practice."

Philadelphia: F. A. Davis, publisher, 1888.

The author wisely tells us for whom he has prepared this work, but we are all students and all subject to examination; and the many facts which he masses together, and his system of question and answer which he pursues throughout the book, lend it an additional interest to the reader surfeited with didacticism. Whether all the questions are pertinent, or all the answers correct, we cannot say. All we have noticed are, and the book seems carefully prepared. It contains many formulæ, some of them quite new to us and of seeming value, and for the student in the anxious stage of preparation we should imagine it a very efficient help. E. W. W.

COMPENDIUM DER ARZNEIVERORDNUNGSLEHRE FÜR STUDIERENDE UND ARZTE. Von Professor Dr. Rudolf Kobert, Director des Pharmakologischen Institutes zu Dorpat.

Stuttgart: Verlag von Ferdinand Enke, 1888.

The brochure of two hundred pages which lies upon our editorial table has apparently for its chief aim the teaching of medical students and physicians such portions of pharmacy as may be especially valuable to them. It consists of the discussion of the world's pharmacopœias; of the method of application of drugs by physicians; and an elaborate account of the various classes of preparations employed.

It is without doubt a valuable aid to Professor Kobert in his teaching of Russian students in Dorpat; but as it is in the German language, and especially as it has close relations with continental rather than English pharmacopœias, it is of apparently little interest to American or English readers.

ARBEITEN DES PHARMAKOLOGISCHEN INSTITUTES ZU DORPAT. Herausgegeben Von Professor R. Kobert.

Stuttgart: Verlag von Ferdinand Enke, 1888.

The production of two such volumes as these now before us as the result of original work in one laboratory in a single year is a notable event in the history of pharmacological advance. The three hundred pages of the two brochures are chiefly occupied with the record of experimental work performed,—work based, however, upon a full knowledge of the labor of others. The list of the papers is as follows:

Vol. I., "Ueber Sapotoxin," von Dmitrij Pachorukow; "Ueber Senegin," von Joseph Atlass; "Ueber Cyclamin," von Nicolai Tufanow. Vol. II., "Ueber die Wirkungen des Chroms," von Heinrich Pander; "Ueber Cytisin," von Raphael Radziwillowicz; "Vergleichende Versuche über die giftige Wirkung der Gallensäuren," von David Rywosch.

Dmitrij Pachorukow reaches the conclusion that sapotoxin is a violent poison for all portions of the nervous system, as well as for the circulation, and for both striated and non-striated muscle, and for the red corpuscles; but that the decoction of the bark of the quillaia as an expectorant is equal to that of senega, that its disagreeable qualities are not greater than those of senega. We would likewise say amen to the banishment of both quillaia and senega from the materia medica as substances of uncertain value in respiratory therapeutics, more than unnecessary in the richness of our modern materia medica list.

As concerns senegin, Mr. Atlass comes to the conclusion that while in its physiological action it is entirely similar to that of sapotoxin, there is a great difference in the degree of activity, and that the two substances are not, therefore, physiologically absolutely identical.

The study of the active principle of the Alpine violet leads friend Tufanow to the conclusion that a mixture of its active principle, cyclamin, with milk, causes every particle of the fat of the milk to separate in the course of ten or twelve hours, and come to the surface; that this cyclamin belongs pharmacologically to the saponine group, which included quillaiac acid, sapotoxin, senegin, digitonin, and smilacin; that the cyclamin is not of the nature of a ferment, and that it has the power of acting locally upon the walls of the blood-vessels both in cold- and hot-blooded animals, so as to cause contraction of their lumen and rise of the blood-pressure, followed by a fall if the dose has been large enough; that it acts directly upon the muscular substance, not only of the heart, but also of the voluntary muscles, so that the myosin coagulates, and that it is of very little, if any, use in practical therapeutics.

Heinrich Pander concludes his elaborate study of the action of the preparations of the chromium salts, with a tabulated collocation of forty-three cases of poisoning, and, by a comparison of the action of chromium with the other metals, reaching the conclusion that of all the metals only the silver in the form of an oxide is as inert as is chromium oxide. It seems evident that in the numerous cases of poisoning caused by chromic acid the symp-

toms have been due to the irritating or corrosive effect of the drug.

Raphael Radziwillowicz believes cytisin to be between strychnine and curare in its pharmacological relations, but to still more closely resemble in its action ulexin. He believes that it is generally capable, in doses of one milligramme, given subcutaneously, of increasing blood-pressure without influencing the heart, and that its use is indicated in all cases where there is a low blood-pressure and relaxation of the vessels.

The paper upon "Wirkung der Gallensäuren," by David Rywosch, points out the poisonous qualities of the bile and its acids, and is more of interest to the pathologist and toxicologist than to the therapeutist. We congratulate Professor Kobert on the result of his laboratory-work during 1887, and trust that the year 1889 may give to us a still more interesting record of work done in 1888.

Correspondence.

CONTRIBUTIONS TO THE DISCUSSIONS ON THE DIAGNOSTIC VALUE OF THE TOLERANCE OF THE IODIDES IN SYPHILIS BETWEEN J. WILLIAM WHITE, M.D., AND H. C. WOOD, M.D.

BY PROFESSOR JAMES STEWART, Montreal; PROFESSOR JAMES NEVINS HYDE, Chicago; PROFESSOR FESSENDEN N. OTIS, New York; DR. JOHN P. BRYSON, St. Louis; DR. JOHN B. CHAPIN, Philadelphia; DR. EDWARD N. BRUSH, Philadelphia; PROFESSOR R. W. TAYLOR, New York; PROFESSOR F. R. STURGIS, New York; PROFESSOR MCCALL ANDERSON, Glasgow; PROFESSOR EDWARD L. KEYES, New York; PROFESSOR ROSWELL PARK, Buffalo; PROFESSOR WILLIAM OSLER, Philadelphia.

DR. H. C. WOOD, Editor of the THERAPEUTIC GAZETTE:

DEAR DOCTOR,—In the December number of the THERAPEUTIC GAZETTE were published my paper on "The Diagnostic Value of the Tolerance of the Iodides in Syphilis," your reply, under the title of "The Iodide of Potassium in Syphilis," and my further comments, "Iodism and Syphilis," which closed the discussion.

As the same number of the GAZETTE contained an editorial request for opinions upon the subject, it occurred to me that an expression of the views of a number of well-known physicians, with special experience in regard question at issue, would be of interest to all those who were already familiar with the opposing theories.

I accordingly wrote to fifteen gentlemen, as follows:

"1810 SOUTH RITTENHOUSE SQUARE,
"PHILADELPHIA, December 28, 1888.

"MY DEAR DOCTOR,—Will you do me the favor, after reading the pamphlet which I send you by this mail, of telling me your opinion as to the question at issue? And, if you can spare the time, will you kindly give me your reasons for that opinion? I intend to publish the replies received from a dozen of the best-known syphilographers and neurologists of the country.

"I need scarcely say that I want to hear from you whether you agree with my views or not. You will greatly oblige me if you can send me an answer at an early date.

"Please believe me, with sincere respect,
"Yours very truly."

In reply I have thus far received the twelve communications which I herewith enclose, and which I send you for publication.

Very sincerely,
J. WILLIAM WHITE.

February 12, 1889.

"MONTREAL, January 10, 1889.

"MY DEAR DOCTOR,—I have been much interested in the important questions discussed so ably by Dr. Wood and yourself in the THERAPEUTIC GAZETTE for December.

"From a careful perusal of Dr. Wood's paper I come to the conclusion that he maintains the following propositions as practically proven:

"I. That in nearly all cases of chronic syphilis, especially in syphilis of the nervous system, the administration of the iodide of potassium is not attended by iodism in any of its forms.

"II. That the administration of the iodide of potassium in health and in diseases other than those of a syphilitic character is almost universally attended by iodism.

"I have always looked upon iodism occurring in the course of the iodide-treatment of syphilis as exceptional, the rule being that it is far from common to find iodism, but the exceptions to this rule are, in my opinion, numerous enough to take away all value from the proposed 'therapeutic test.'

"It appears to me that iodism is simply a proof that the elimination of the drug is to some extent effected by the skin and mucous membranes, and that the tolerance of large

doses for long periods is explained by the eliminating surfaces becoming accustomed to the irritating effects of the drug. If any part of the cutaneo-mucous tract is the *locus minoris resistentiæ*, we have symptoms of irritation of that part.

"As a rule, to which, however, there are no doubt many exceptions, the more active the draining powers of the kidneys, the less likely is there to be iodism, because there is less elimination through the skin and mucous membranes. The less the elimination through the kidneys, the greater the danger of iodism. There is abundant clinical proof for the last statement.

"Dr. George Johnson* has especially called attention to the frequency of iodism in cases of chronic Bright's disease.

"There can be no lack of evidence to prove the truth or falsity of the assertion,† that 'the vast majority . . . of persons who are free from syphilitic infection cannot take doses of over 10 grains of the iodide three times a day without the production of iodism, unless as the result of the habitual use of the remedy. When iodides are tolerated by the normal individual, such individual is said to have an idiosyncrasy, which makes him an exception to the general rule.'

"The action of the iodides in health, or in those who have some temporary or trifling complaint, is, in my experience, mostly a matter of dosage.

"When given in doses of 1 to 3 grains three times daily, running at the nose almost invariably is seen; but if the quantity be increased to 20 grains and upward three times a day, the coryza at once ceases. I am unable to offer any explanation of this marked difference in the action between large and small doses. Brunton‡ refers to this difference, and I believe that it is a very common experience.

"I have had no experience of the action of very small doses in chronic syphilis. I have no doubt that such a test would be instructive, and would possibly throw some light on the questions in dispute.

"There are two diseases where the iodides are usually given in considerable doses and for lengthened periods, and where there is, as far as I am able to determine, the same degree of immunity from iodism as there is in syphilis. I refer to aortic aneurism and chronic lead-poisoning. Dr. George W. Balfour, of Edinburgh, who probably has had more experience with iodide of potassium in aortic aneurism than any living author, says,§ that he has only twice seen cases of complete intolerance of the iodide.

"Dr. George Ross, of Montreal, who has treated a large number of cases of aortic aneurism with iodide of potassium, says that it is a very exceptional occurrence to find any symptoms of iodism.

"It must be admitted that in a certain proportion of cases of aortic aneurism the patient is syphilitic.

"I have treated, during the past five years, upward of twenty cases of chronic lead-poisoning, and in not one instance is there any record of any iodism, and, with the exception of one case, there was no history of syphilis.

"I believe that my experience of the subject under consideration warrants me in coming to the following conclusions:

"I. That the exceptions to the rule, that iodism is very rare in syphilis of the nervous system, are too numerous to admit of the proposed 'therapeutic test' as being of value.

"II. That in certain other diseases (aortic aneurism and chronic lead-poisoning) treated with iodides, we have as pronounced an immunity from iodism as we have in syphilis.

"III. That in health iodism is the rule only when very small doses are taken, while large doses quickly arrest the iodism induced by the small doses.

"IV. That the toleration of large doses (10 to 20 grains) in health is the rule and not the exception. The advent and *not* the absence of iodism proves the idiosyncrasy of the individual.

"JAMES STEWART,

"*Professor of Therapeutics and Lecturer on Diseases of the Nervous System in McGill College, Montreal.*"

"I have read with great interest the two contributions to the subject of the diagnostic value of the tolerance of the iodides in syphilis made by Drs. J. William White and H. C. Wood, of Philadelphia. Being asked for my view of the questions upon which they fail to agree, it is needful to admit at the outset that one is justified in speaking with hesitation on any point in controversy between two col-

* Quoted by Lewin in his work "Untoward Effects of Drugs," p. 111.

† Wood, H. C., THERAPEUTIC GAZETTE, December, 1888.

‡ "Pharmacology and Therapeutics," 3d ed., p. 253.

§ "Diseases of the Heart," 2d ed., p. 459.

leagues of such distinguished position and large experience.

"A personal quality in the statements which follow is almost unavoidable. My written records cover only about fifteen years of experience, both in private practice and in civil and military hospitals, the cases of patients having nervous complications of the disease being not separated from the thousands exhibiting other symptoms of syphilis. Of immediate practical value in this connection is the fact that during the last five years, both in private and consultation practice, nervous syphilis in all grades from milder to grave and even fatal cases, has become disproportionally frequent.

"It is proper to admit here that the more highly specialized a man's experience, the less competent he becomes, not necessarily but presumably, for a decision of questions involving comparisons between the subjects of such specialized and non-specialized study. In this view, Dr. Wood, it seems to me, has some advantage over both Dr. White and myself. Dr. Wood appeals, as ground for acceptance of his views, to a hospital experience in fifteen years of more than two thousand patients, between twenty-five and fifty per cent. of whom were victims of non-syphilitic nervous disease. During the same period of time, while not able to speak for Dr. White, I believe that my personal experience in non-syphilitic nervous disease has been in comparison with these figures not worth citing.

"Under the comprehensive and acceptable term 'iodism' are now included and accurately tabulated an enormous list of symptoms of iodic intoxication exhibited in almost every system and viscus of the body, including what may be termed a mimicry of almost every cutaneous disease in our nomenclature. No ampler and more exact exposition of the subject has been made than in the monograph entitled 'L'Iodisme,' written by Dr. Elizabeth Bradley, and published in Paris in 1887. In this excellent work are included all the cases referred to by Dr. Duffy, cited by Dr. White. Two of my personal memoirs on the bullous rash induced by the iodides are here summarized. A few contributions to the subject which have appeared at a later date are, of course, wanting,—*e.g.*, Hallopeau's 'Report of Singular Cicatriform Lesions following an Iodide Exanthem;' Taylor's paper (read before the First Congress of Physicians and Surgeons in Washington in 1888) on so-called Acne iodo-potassique Anthracoïde;' and my paper on 'Dermatitis Tuberosa due to Ingestion of the Iodine Compounds,' read before the same body at the same date with Dr. Taylor's.

"Recognizing, then, the very wide range of phenomena included under the term 'iodism,' Dr. Wood's position may be tersely stated as follows:

"*a.* The majority of persons in health cannot tolerate large doses of the iodides.

"*b.* A large number of persons in health can secure such toleration by careful graduation and increase of the dose.

"*c.* A notable exception may be found in a small minority of persons in health who enjoy complete toleration as the result of idiosyncrasy.

"The reverse of these propositions is also held to be, in the main, true; thus:

"*a.* The majority of syphilitic persons tolerate large doses of the iodides.

"*b.* Careful graduation and increase of the dose in syphilitic patients does not interfere with toleration.

"*c.* A notable exception may be found in a small minority of syphilitic persons who cannot tolerate the iodides as the result of idiosyncrasy.

"From these propositions it is inferred that when in any person toleration of the iodides in large doses is exhibited, the diagnosis of syphilis is warranted if symptoms are also present of obscure organic disease. In another paragraph Dr. Wood indicates that failure of production of iodism by sixty grains of the iodide of potassium ingested daily practically establishes a diagnosis of syphilis.

"As to terms here used, it is understood and agreed that for purposes of the present question the 'syphilis' of Dr. Wood's paper is nervous syphilis, belonging to the advanced, late, or gummatous stage of the disease, which, it is well understood, may occur in special cases speedily after infection.

"Dr. White urges effectively, *per contra*, that the indications for the free use of iodine do not exist until this advanced or later stage of the disease has been reached, when the blood and tissues are not demonstrably pervaded by an active and generalized virus; when this virus has become non-symmetrical, non-contagious, and in many cases non-transmissible; when, in point of fact, there is no virus which a poison can neutralize. In this he is in full agreement with most syphilographers, and might even have added, that a coarse test of any physician's expertness in the management of the disease is here

furnished, most general practitioners hastily employing the iodide at periods when the expert finds no indication for its use. But the impressive fact is not to be forgotten, that while not demonstrably in its later or even last stage a generalized disease, still, after syphilitic infection, some general and persisting effect has surely resulted upon the system at large, since a new infection is, for the immense majority of all patients, impossible. No one can verify the exactness of Colles's law in a series of years and cases without reaching the clear conviction that the mother of the syphilitic child, even though herself exhibiting no symptoms, symmetrical, contagious, or transmissible, even though under the influence of no demonstrable virus, yet exhibits completest and fullest immunity as against the infectious mouth of her syphilitic offspring.

"It must also be freely admitted in Dr. Wood's favor, that toleration of the iodides by the syphilitic patient by no means indicates relief of syphilitic symptoms, that many cases of severe nervous syphilis are benefited immediately by mercury when the largest doses of the iodides are apparently without value, that the sequelæ of syphilitic lesions may be as serious in results as those immediately due to the lesions themselves, and that sclerosis in syphilitic subjects is certainly not amenable to specific treatment. This much admitted, I find myself totally unable to agree with this eminent author that there is any antagonism between the action of the poisons of syphilis and the iodine compounds to an extent justifying diagnostic conclusions. For,—

"I. We may entertain the suspicion that if we only knew enough there need be no intolerance whatever of the iodides by any person. The mischief is, we do not know how to establish toleration for some patients, while we do know for some others how to compass this end. Any conclusions based on different methods of administering the drug in different periods of the life of one person must be practically worthless. Given a uniform method and uniform conditions, and the number of idiosyncratic patients becomes rapidly smaller. Of this I am thoroughly convinced by experience. A few years ago I began to use only one method of administering the iodides, and by this term it may be conceded that all parties to the discussion intend to designate chiefly the iodide of potassium. That method was to employ a saturated solution, one grain to the minim of distilled water, given in milk, when that vehicle was not found to disagree as an article of diet with the patient to be treated. The dose was made, at the outset, not more than 5 to 10 drops; the increase was ordered every three or four hours; and in face of the chemical dictum lately set forth, that the drug should always be given fasting, it was ordered after a small quantity of food was ingested. In this way the larger doses, as high as eight hundred grains daily, have been reached. I note, in passing, that it is my conviction that the very largest doses reached have not seemed as valuable as those which may be described as 'large,' the majority of all brilliant results being attained, I think, by a dose within rather than beyond two hundred grains daily.

"Observance of a uniform method in scores of cases soon led to the conclusion that 'idiosyncratic' patients were far fewer than was at first supposed. Careful graduation of the dose, and elimination of the cases in which the patient, eager for aid, surreptitiously swallowed more than his dose, threw new light upon this question. Again, the marked idiosyncratic exceptions that were observed soon occurred with symptoms of intoxication not cutaneous in type. Violent abdominal pains, tumefaction of the belly, grave prostration, and indefinable nervous impressions, which patients found difficulty in describing, but which they referred to with evident horror,—these were of the class that proved exceptions to the rule. The symptoms of iodism strictly cutaneous in type and of the odd appearance which I have described in my papers, were of the sort generally to which Dr. White refers,—that is, suddenly occurring at the outset of administration of the drug, in non-syphilitic (often very young) patients treated somewhat awkwardly by general practitioners for eczematous and other diseases of the skin. Let me note, in passing, on this part of the subject, that of these cutaneous rashes, one, I am satisfied, is etiologically separated from all the others. Whether the others be reflex, vaso-motor, or tropho-neurotic phenomena, or whether they be in part due to abortive efforts at elimination of iodine by the emunctories, it is certain that severe forms of purpura, even at times alarming in grade, may ensue long after full toleration has been established, being displayed most conspicuously in the lower extremities and over the belly. This, there can be but little question, is due to weakness of the vascular capillaries

(probably induced by both syphilis and iodine intoxication long continued), a condition in the adult not greatly different from some of the reported forms of hæmophilia due to inherited syphilis.

"II. The fact that most patients exhibiting the symptoms of nervous syphilis are in the early periods of adult life, when the tissues are far more tolerant of toxicants than in youth, late middle life, and old age, is not only in part explanatory of the fact urged by Dr. Wood as evidence of syphilis, but is to be considered in connection with

"III. The further fact that most victims of nervous syphilis are of the male sex. The reasons for this are so evident that they need not be enumerated. If, now, we compare the men in the vigor of this period of life, mostly in the third decade, stricken with nervous syphilis at the date of the fullest enjoyment of sound health for the average of their race, possessing good average powers of resistance to poisons, and having relatively coarse skins, with the twenty-five to fifty per cent. of Dr. Wood's hospital patients having non-syphilitic nervous disease, what do we find? We may assume that Dr. Wood's patients were of the class that other physicians find in other cities than Philadelphia, similarly disordered. He probably had his full share of cases of infants and children affected with infantile spinal paralysis, chorea, tubercular meningitis, hydrocephalus, convulsions, and other nervous disorders of that period of life. Certainly, as regards cutaneous symptoms of iodism, this furnishes, in my experience, the most favorable class for such exhibition. He probably includes in his statistics the cases of hystero-epilepsy and hysteria in women, more particularly in young women, and those of catalepsy with other affections of the nervous system peculiar to that age and sex. Surely we may consider these girls and young women with delicate skins as second in the list most liable to iodic cutaneous manifestations, little apt to enjoy tolerance of the drug. Lastly, we may name the senile patients with *ramollissement*, paralysis agitans, and similar disorders, including those in the fourth decade of life or later, exhibiting symptoms of *délire de grandeurs*. No one of the classes here suggested includes patients whose tissues have such power of resistance to poisons as those of our average male patients with signs of nervous syphilis.

"Lastly, IV., and this point has been touched upon above, the suddenness of at- t of nervous syphilis in our average male patient in the second decade of life brings him before his physician with a good reserve of vital energy to draw upon in an emergency. Possibly this furnishes in part the excellent statistical results of treatment in cases early recognized. If he lie in bed, apparently near his end, but actually destined to survive the natural expectation of longevity for his age, he has often a torso that might serve for a sculptor's model. He may drag a lower limb that would not deform a statue of Apollo, or, when taxing the English language for terms in which to eloquently describe his agonies of the night, exhibit a face that to all but the eye of the expert might pass for that of one in sound health. I have often been struck with the fact, that the average patient exhibiting marked syphilitic cachexia is not of this class. The cachectic is often the hospital patient presenting the most repulsive of the pictures in the gallery of deformities producible by lues. He may have what the farriers call a 'splint' on each leg from osteo-periosteal disease; his pinched and sallow features tell a pitiful story of malnutrition; the nose may be simultaneously flattening from caries of its bones; he may also exhibit half a dozen deep and formidable ulcerations from degenerating gummata,—and yet not suffer from any one of the many signs of nervous syphilis that may be fully shown in the next well-nourished patient under observation without an external stigma of disease.

"I conclude with the remark, that if Dr. Wood should come to me with the statement that he had under observation a vigorous male patient in the second decade of life, with an obscure disease of the nervous system, who was tolerating large doses of the iodide of potassium so well that a diagnosis of syphilis was practically established on that basis alone, and that the reason for the tolerance was an antagonism between the virus of syphilis and the poison of the iodide, I should respond: 'Granting the exactness of your hypothetical diagnosis which, in any event, I regard as well placed, one is justified in believing that your patient tolerates well the remedy you have employed, because he is what he is, syphilis wholly excepted.'

"JAMES NEVINS HYDE,
"*Professor of Dermatology and Venereal Diseases in Rush Medical College.*
"CHICAGO, January 5, 1889."

"NEW YORK, 5 WEST FIFTIETH STREET,
"January 10, 1889.

"MY DEAR DOCTOR WHITE,—In answer to your request for my opinion in regard to the diagnostic value of a toleration of large doses of the iodide of potassium in determining the presence of syphilis, and also the reasons for that opinion, I reply to the first by an expression of my belief that such toleration is wholly valueless as a proof of the present or antecedent existence of syphilis in any case. As to the reasons for this opinion, I wish to say that, during an experience of over thirty years in the study and treatment of syphilis, I have met repeated cases where the iodide of potassium has been administered up to a drachm three times a day with easy tolerance in individuals suspected of having syphilis, but in whom there was no positive evidence of the existence of the disease in its early or late forms, and where the subsequent history confirmed this position. I have also myself, in testing cases where the diagnosis was doubtful as between cancer and syphilis, repeatedly found the highest tolerance in cases which subsequently proved to be cancerous. On the other hand, I have met many cases of unquestionable syphilitic origin where the most marked intolerance of the iodide of potassium was present; where from 5 to 10 grains, thrice daily and largely diluted, would promptly produce some form of iodism. In one case in particular, which I shall not readily forget, 10 grains of the drug, thrice daily for a week, produced œdema of the pharynx and glottis, which nearly proved fatal. I have at the present time under observation two cases, who have an undoubted syphilitic history, where any attempt to raise the dose above 10 grains produces coryza and indigestion within a few days to an extent making its continuance unbearable; and again another, where 5 grains produce an unpleasant aching in the parotid and submaxillary glands within an hour. I have also seen repeated cases of grave cerebral trouble where a claimed intolerance of the iodide of potassium has been the basis of a diagnosis excluding syphilis, and yet where, by varying the methods of administration of mercury and the iodide of potassium previously pursued, these remedies have been tolerated to the extent of producing manifest improvement, and in some cases even cure. Prominent among my records is a case coming to me from a distinguished specialist in mental diseases, where, because of the apparent intolerance of both mercury and the iodide of potassium, the case was pronounced one of the melancholic forms of general paralysis of the insane, non-syphilitic, and hence hopeless. Under a more careful and persistent effort, resulting from positive knowledge of a previous syphilitic infection, a toleration of both mercury and the iodide of potassium up to the full physiological effects of each resulted in rapid and apparently complete recovery,—the patient being now (January 10, 1889) in perfect bodily and mental condition, and having been so for nearly two years.

"A few words in regard to the reasons which seem to me to support the results of my clinical observations. The late lesions of syphilis are especially in question. Professor Wood says, on page 12 of your discussion, that '*the tolerance of the iodides* belongs to the advanced rather than to the early *stages* of the disorder.' The late lesions of syphilis (sequelæ) can, I think, be reasonably shown to be always *local* in their nature and development, and always to begin by a deposit of the so-called 'gummy' material. This scientific investigation has shown to consist chiefly if not wholly of germinal material, and in no way different from that of normal origin.* In further proof of this position is the fact that, under favorable circumstances, it is capable of organizing into fibrous or cicatricial tissue. Subjects of gumma are ordinarily quite well, except from the mechanical effects of its presence. The children they beget are free from any syphilitic taint.† The removal of the gumma, wherever situated, may be effected by the efficient use of the iodide of potassium alone, resulting in a prompt disappearance of symptoms, and, if the removal of the deposit is complete, there is likely to be no return. But if more or less sclerosis has occurred, the use of the iodide is found to be inefficient. This agent seems not to be of sufficient power to produce fatty degeneration, to remove the deposits after a certain degree of organization has taken place. In such cases mercury is found of greater efficiency,—not because it is an antidote to syphilis, but because it is the most powerful of all known agents in producing fatty metamorphosis. No increased tolerance of mercury is claimed in persons the subjects of syphilis. The physiological effect of

* See "Cornil on Syphilis," translated by Professors Simes and White, page 206. Lea & Co., Philadelphia, 1882.

† See Fournier, "On Syphilis and Marriage," page 231. Paris, 1880. Also Otis, "On Syphilis and the Genito-Urinary Diseases," page 171. Putnam, New York.

mercury consists simply in a more or less pronounced fatty degeneration of healthy tissues, first observed in the mouth and adjacent gland-structures. This occurs quite as promptly in the syphilitic as in the non-syphilitic. There would appear, then, to be no especial reason why the iodide of potassium, which apparently acts upon the late lesions of syphilis practically in the same way, should be credited with a salutary antagonism to a poison which is fairly well proven to have no existence in the so-called tertiary or late stages of syphilis. I feel confident that further careful observation of the nature and treatment of syphilitic disease in its various stages and sequelæ will show that the antidotal view of remedies in syphilis is untenable, and that the medicines and measures which prove most useful in the treatment of this disease will be found in no sense peculiar in their effects upon persons who have, have had, or who have not had syphilis.

"Very truly yours,

"FESSENDEN N. OTIS,

"*Professor of Genito-Urinary Diseases in the College of Physicians and Surgeons, New York.*"

"DEAR DOCTOR WHITE,—A careful reading of the pamphlet sent me leads to the inference that the 'question at issue' referred to in your note of December 28, 1888, and concerning which you request my opinion, is fully embodied in the following sentence quoted by you from Dr. H. C. Wood: 'In all cases of doubtful diagnosis the so-called therapeutic test should be employed, and if sixty grains of the iodide of potassium per day fail to produce iodism, for all practical purposes the person may be considered to be a syphilitic.' Now, if I am asked whether I consider this broad rule of action sufficiently reliable to form the basis of a diagnosis, I reply that I do not. I believe that its application in practice in doubtful cases would lead to error in two directions:

"1. By leading to a diagnosis of syphilis when that disease was not present; and,

"2. By failure to diagnosticate the disease when it was present.

"And, furthermore, I believe that either of these errors would occur so frequently as to seriously vitiate the result. The fact that they lead to error in opposite directions doubles the ultimate effect and all the more confirms me in the opinion that the rule itself is *fallicissima res.*

"It seems hardly necessary to say that my belief is based upon my observations of the frequency of the occurrence of iodic intoxication ('iodism') in cases of late—that is, the so-called tertiary—syphilis. Only exceptionally do I give the iodides in the earlier manifestations, and this for the reason that they are not then needed; but I do give them, and find that they produce 'iodism' as frequently as in the later stages, but not more so. In what I have to say here in relation to the value of the non-appearance of 'iodism' as a diagnostic of the existence of syphilis, let it be understood that I confine myself to the employment of that drug in the later stage. Also, let me say that, for present purposes, the term 'idiosyncrasy' is held to mean an individual peculiarity which causes a certain proportion of our patients to exhibit symptoms of the toxic effect of the drug when given in moderate or small doses, while 'iodism' should include 'the various forms of iodic intoxication, the most common of which are gastro-intestinal irritation, coryza, lachrymation, mental depression, tinnitus aurium, and a pustular eruption (acne) upon the cutaneous surface.' With this understanding, I am quite within bounds when I say that fully fifty per cent. of the cases of late syphilis treated by me exhibit iodism long before sixty grains per day is reached. In fact, it is only in a minority of the cases that *some* of the toxic effects fail to show themselves before a dose of thirty grains per day is reached. If we include all the untoward effects of the iodides which we see in the eyes, nose, pharynx, fauces, mouth, stomach, skin, and nervous system under the term iodism, I cannot make out that the size of the daily dose bears any relation whatever to their appearance. So far as I can see in practice, a given patient who bears 5-grain doses thrice daily, without any toxic effect, will bear equally well 20-grain doses repeated at the same intervals. My own observation, then, accords with the assertion of Jonathan Hutchinson, that the size of the dose bears no relation to the frequency of the toxic effects. The most dangerous case of iodism which I ever had in my practice followed quickly upon a 3-grain dose. When an important viscus (brain, liver) is threatened, or when any organ is having serious damage wrought in it by syphilis, I do not suppose that any one would be deterred from pushing the remedy by the occurrence of a minor evidence (acne, coryza) of iodic intoxication. And, perhaps, after all, here lies the reason for the great

discrepancy of evidence in this matter. Patients often overlook the minor evidences until attention is called to them by the physician; and it seems to me to go without saying that cases of cerebral syphilis would be vastly more apt to do this than any others.

"That there is wide difference of opinion in regard to the relative tolerance of the iodides by the syphilitic and the non-syphilitic, as well as in the views of different observers and investigators as to the means to be resorted to to determine the question, there can be no doubt. Upon one point, however, there is practical unanimity of opinion, as indeed there could not help being: this is the fact that 'iodism' does appear on the administration of moderate, even small, doses of the drug to patients who we know have syphilis in the later stages. Here there is common ground upon which all may meet and fight the battle out, even if figures are to be the weapons. Meeting here, it will make no practical difference whether syphilis in any stage increases the tolerance of the iodides. The question will then be, whether 'iodism' occurs frequently enough in syphilitics to render the rule quoted above ineffective for diagnosis. I believe it does. If this view is the correct one, then any discussion of the question of tolerance, highly interesting as it is, is of no practical use in the determination of the diagnostic point. If the question of this 'idiosyncrasy' can be eliminated by reason of its infrequency, then the matter of relative tolerance will be of high value.

"Figures as to this frequency of iodism in syphilitics I confess my inability to give, for the reason that neither at my clinic nor in my private practice have cases been recorded with this question in view; and I do not believe that the mere relation of such few cases as I now have in mind would accomplish the object sought.

"Very sincerely yours,

"JOHN P. BRYSON,

"*Fellow of the American Association of Genito-Urinary Surgeons.*

"ST. LOUIS, January 28, 1889."

"PENNSYLVANIA HOSPITAL FOR THE INSANE,

"PHILADELPHIA, January 25, 1889.

"DEAR DR. WHITE,—I have read the reprint of a discussion between yourself and Dr. H. C. Wood, taken from the THERAPEUTIC GAZETTE. The proposition which Professor Wood has announced is likely to attract attention, both on account of its novelty and because it is a very positive statement about a subject that is considered obscure and unsettled. If Dr. Wood's views turn out to be correct eventually, his present position certainly is that in which some of our legal friends find themselves,—with a good theory of law on their side, but not the facts to sustain it. The vigorous and temperate tone of the discussion is most commendable. A general response to the questions growing out of the discussion and the questions announced in the THERAPEUTIC GAZETTE cannot fail to throw much light upon this subject.

"Referring to exact data in my own experience, it may be stated that, at the present time, of three hundred and ninety patients in this hospital, one and a half per centum have such a history of syphilis that their insanity may be fairly attributed to that cause. From observation in hospitals for the insane outside of cities, the proportion does not seem to be as great, if we exclude paretics. In the production of paresis syphilis is as yet an unknown factor. The departments of a city almshouse hospital contain a population deteriorated by a low heredity and broken down by various vicious indulgences, that 'tolerate' medication to an extraordinary extent, as a rule. It is an element to be considered in deductions made from observations among this class, and might otherwise form a source of error.

"I recall five cases in which the insanity resulted from syphilis where the iodide of potassium was administered to the extent of forty-five and eighty grains daily. The medicine was discontinued because it produced gastro-intestinal irritation. In 1857 I reported a case of insanity from syphilis that recovered under the use of iodide of potassium in 5-grain doses three times daily. One case recovered in this hospital under the use of one hundred and eighty grains daily, and another made a good recovery taking eighty grains daily.

"So far as these cases go to establish any result, the majority show that extraordinary doses were not borne, and the medicine was discontinued, and in one case that a small dose accomplished as much as a large dose did in another case. But it may be said the diagnosis of these cases was not in doubt. It is conceded they were not, yet they show that a small dose and moderate doses sometimes accomplish the desired result as well as extraordinary doses; also, that the known existence of syphilitic disease did not prevent iodism, even in moderate doses.

"We are told, however, that in all cases of doubtful diagnosis, if the so-called therapeutic test is employed without producing iodism, the person may be considered a syphilitic. Does such a test commend itself to our best judgment as conclusive? Having administered large doses of a drug to a doubtful case, and not poisoned our patient or produced any other result, perhaps, are we to conclude he is a syphilitic? What has occurred to solve our doubts? Are our results not wholly negative, and is not an opposite conclusion equally legitimate? Is it true that in these tertiary cases we are contending against an active virus that is said to neutralize large doses of the iodide, or are we not rather seeking in our treatment to remove the results of the virus in its active stage, as we aim to remove the results of a meningitis, and exudations in other diseases? Cases of chronic rheumatism, obscure mental and nervous diseases, and meningitis occur which bear large doses of the iodide. Must we for this reason conclude they are syphilitic? If in a doubtful case the iodide cures our patient, our doubts may be said to be removed. But can it yet be said to be settled that the existence of syphilis was established? If we administer the iodide in a doubtful case and have no result and have not poisoned our patient, we have only established the fact that no idiosyncrasy exists,—perhaps nothing more. I cannot concede that a new principle can be said to have been evolved from what has yet appeared. If it has been and will stand the test of experience, it must have a wider application in the practice of medicine than that which has been made of it to the class of cases in question.

"Very truly yours,

"JOHN B. CHAPIN,

"*Physician in charge of the Pennsylvania Hospital for the Insane.*"

"PENNA. HOSPITAL FOR THE INSANE,
"DEPARTMENT FOR MALES, January 26, 1889.

"MY DEAR DR. WHITE,—I am under many obligations for the opportunity of reading the 'Discussion' between Dr. Wood and yourself.

"In answer to your request for my opinion upon the question at issue, I do not know that I can say anything which will add to the interest or value of the discussion so ably opened. At the same time, I must say that I have pretty firm and definite opinions based upon considerable experience with syphilis in its ordinary manifestations, as well as with so called nervous syphilis.

"The late effects of syphilis, especially in the way of nerve-lesions, have interested me ever since my entrance upon the practice of physic. Indeed, my inaugural thesis was upon 'Syphilitic Affections of the Nervous System.'

"It seems to me that to base a diagnosis of syphilis upon the tolerance of large doses of the iodide of potassium, in cases in which the diagnosis was otherwise obscure and doubtful, would be unwise and at variance with the judgment and experience of the profession. I was long ago taught, in cases where the least doubt existed, and where its administration was not contraindicated by other conditions, to give the iodide, and to push it to the limit of toleration where such heroic treatment seemed desirable; but I have never ventured to diagnose syphilis, even in cases brought to a successful issue, because of the success; much less would I feel justified in so doing because of mere tolerance of any particular drug.

"If Dr. Wood means to say that few normal individuals (free from syphilis?) can tolerate sixty grains of the iodide a day, if at once placed upon that amount, I see no reason for differing materially with him; but still I am sure that there are numerous individuals who are, as far as syphilis is concerned, normal, who can rapidly be brought to take sixty, eighty, and ninety grains of the iodide a day. On numerous occasions I have prescribed at once 20-grain doses, to be repeated three times daily, and the instances in which any intolerance was shown were exceedingly rare. I cannot be induced to believe that all these cases who had a tolerance for the drug had syphilis; indeed, I know that many of them did not. It has been my habit for years, in prescribing the iodide, to commence at 10 grains, and, when desirable, to increase by adding one grain a day to each dose, the doses being given three times daily at least. The records of numerous cases which have occurred since my connection with this hospital do not show a single instance of iodism or anything pointing in that direction, except in one markedly syphilitic case (initial lesion in 1868), who had a profuse crop of acne after taking 10 to 13 grains three times daily for a few weeks.

"This case leads me to refer to another, in which there was a peculiar idiosyncrasy. I saw the patient, a medical man, in the spring of 1873, suffering from a neurosis of evident syphilitic origin. This patient could not take 20 grains of the iodide in solution three times

daily without having marked coryza, disturbance of digestion, etc., but he was able to take 96 grains in pill form three times daily for weeks with no ill effects.

"It may be answered that of these large doses a considerable proportion passed off by the bowel. The result proved the contrary, as rapid improvement occurred under the treatment by the pills, which had not taken place under its persevering use in solution. It would certainly have been wrong to have excluded syphilis because of the non-tolerance of the large (20 gr.) doses in solution.

"About the same time I saw a gentleman whose case had been progressively growing more serious, notwithstanding active and apparently judicious treatment. He had insomnia, great pallor, emaciation, and general malaise. There was no suspicion of syphilis, had never been any exposure, and the gentleman had no object in concealment; moreover, he knew the importance and bearing of the questions regarding syphilis which were put to him. His only heredity was a gouty diathesis. Under the use of the iodide of potassium, commencing at 20 grains, and rapidly increasing the dose to 60, and then to 90 grains, three times daily, this patient put on flesh, gained in color and strength, and eventually made a good recovery. The exact pathological condition was never diagnosed, but certainly syphilis must be excluded.

"I have administered, or seen administered, large doses of the iodides in cases of goitre, in certain rheumatic affections, in plastic pleurisy, in the treatment of aneurism after Balfour's suggestion, and in varied affections of the brain, chronic meningitis, tumor, acute hydrocephalus, etc., and while I cannot now refer to figures, I am confident that the tolerance of the drug was as great in non-syphilitics as in syphilitics. I speak with some confidence on this point, for the reason that long ago I established the rule of impressing upon persons whom I had treated for syphilis the importance of always in any subsequent illness informing the attending physician of the constitutional taint, and in cases which came under my care or observation with other diseases, I have been equally careful to inquire as to specific infection.

"In cases of insanity the history is often obscure, for the reason that the only person who could affirm or deny the suspicion of syphilis is not in a state to give reliable testimony, but something over ten years of pretty active service in this field has not given me any data to confirm Professor Wood's theory. I have been in the habit of using during that time doses of the iodide, ranging from thirty to three hundred grains daily, in syphilitic and non-syphilitic cases, but I feel as confident as I do of any conclusion drawn from experience, that the tolerance in syphilitic cases was not sufficiently marked, as compared with non-syphilitics, to offer any grounds upon which to base a theory or make a diagnosis.

"I do not know of any reason for supposing that the tissue-changes from syphilis are alone of such a character as to cause a tolerance of the iodides in the animal economy, if we admit even that such tolerance may be produced by disease. An examination of the facts would seem to indicate the contrary, as well as when we argue from theoretical grounds alone. No disease yields so readily to medicine as late syphilis does to the iodide of potassium, and yet Professor Wood asks us to believe that the very drug which has such a power over the disease is rendered by that disease innocuous to the body in which the disease resides.

"I do not see that anything is to be gained by Professor Wood's suggestion, as much as I am loath to differ with so able and experienced an observer.

"If syphilis cannot be diagnosed by other means, why is it necessary to call the case syphilitic because a drug successfully employed in the treatment of syphilis is tolerated, or even brings about a recovery? If mere toleration is all that is observed, nothing is gained, surely; and if recovery takes place, what advantage is there in knowing that 'for all practical purposes' the case was syphilitic?

"If the iodide of potassium had no remedial power except in syphilis, a diagnosis might be safely made after successful treatment; but mere tolerance of the drug would give no safe and proper ground for judgment. It seems to me that nothing is to be gained, and some risk at least of injustice to the patient is incurred by such reasoning.

"Very sincerely yours,

"EDWARD N. BRUSH,

"*Assistant Physician Pennsylvania Hospital for the Insane.*"

"January 30, 1889.

"DEAR DR. WHITE,—The keynote to the discussion between yourself and Dr. Wood seems to me to hinge upon the latter's statement that 'In all cases of doubtful diagnosis (of cerebral syphilis) the so-called therapeutic

test should be employed, and if sixty grains of iodide of potassium per day fail to produce iodism, for all practical purposes the person may be considered to be a syphilitic.'

"Leaving out of the question, for the sake of brevity, the intimate changes induced in the system by the iodides and the nature of the syphilitic person, I will briefly give you the result of my observation and study of the action or rather behavior of these drugs.

"In the first place, I must protest against the current idea of confounding idiosyncrasy with intolerance. Very many persons have an idiosyncrasy against the iodides, but in very few is there an actual intolerance. This is particularly fortunate for them and for us.

"As to the action of the iodides in non-syphilitics my experience has convinced me that these salts are well borne by very many patients of both sexes and of all ages. In some, however, they produce such lesions and affections as dermal inflammations, coryza and lachrymation, œdematous swelling of the parts supplied by the fifth nerve, cerebral hyperæmia, mental and physical depression, and gastro-intestinal irritation.

"Of these cases, it may be said,—

"1. That they may be persistent even when all possible means of amelioration have failed.

"2. That in many instances, if the drug is pushed, notwithstanding perhaps some discomfort to the patient, these unpleasant and sometimes alarming phenomena will cease and the drug will be not in any way harmful and actually beneficial.

"3. In some of these cases we, as they say, 'weaken' too quickly and give up the drug, whereas, if with proper moral courage (the urgent necessity of course existing) we increase the dose and go ahead, toleration is established. In many cases in my experience *small initial doses* have produced mischief, while the succeeding larger ones have been very acceptable.

"4. In many cases, abstinence from liquors, alcoholic and fermented, care as to the simplicity and easy digestibility of the food, requisite medication for the stomach, and a general improvement of the alimentary canal will be followed by a proper acceptance of the drug, perhaps with some preliminary skirmishing.

"5. I have seen several cases in which the iodides were well borne, previous to the onset of pathological changes in the kidneys, and after the evolution of the latter they were more or less toxic in their action, sometimes so much so that their administration was of necessity suspended.

"6. I call to mind three cases in which, while the patients were high livers and deep drinkers (one exclusively of champagne), the iodides were not borne without great discomfort, but when they discarded these irritants and stimulants, the iodides produced no discomfort (cerebral, dermal, nasal).

"7. I have seen cases in which an intolerance of the iodide of potassium lasted twenty years, and at both ends of that period produced a characteristic bullous eruption.

"My experience has not convinced me that syphilis gives a man any immunity, partial or complete, to the toxic action of the iodides. Indeed in general the experience I have already detailed with virgin subjects applies to syphilitic individuals. The secret of very many cases rests in the fact that dire necessity compels the continuance of these drugs, and the so called intolerance is forgotten.

"In syphilitics as in healthy subjects an intolerance of to-day may be replaced by a condition of assimilation a month, a year, or several years hence.

"I call to mind the case of a man who had gummatous infiltration into the soft palate, and seemed intolerant of the iodide of potassium. I pushed it, however, and his intolerance ceased before the infiltration was absorbed. Four years later (after a life of great indulgence) he had syphilitic pachymeningitis, took heroic doses of the iodide, showed no intolerance, and got well.

"I strongly suspect that many cases which have led Dr. Wood to formulate his therapeutic test are like the one just mentioned, and that a previous course of the iodides has conquered the intolerance which may have existed in them.

"In this connection I would call your attention to the case of 'Dermatitis of Iodic Origin,' reported and figured by me in the *New York Medical Journal*, November 3, 1888. The patient, three years syphilitic, suffered from nocturnal pain in the head, not localized but more severe in the forehead and eyes. For six days he took twenty grains of the iodide thrice daily, for six days longer he took twenty-five grains, then the dose was increased to forty grains, with the effect of producing in fifteen hours one of the most severe forms of iodic eruption known. The necessity, however, existed for still larger doses, and he got them without any intermission. The dermal lesions ceased and he lost his pain in the head. He had enlarged spleen but healthy kidneys.

"In conclusion, after a careful study of your

papers and of Dr. Wood's rejoinder, leaving out of consideration all hypotheses and judging from the facts of observation and study as far as I am able to do so, I must say that I think that your three postulates stated upon page 8 of your pamphlet are sound.

"Very truly yours,

"R. W. TAYLOR,

"*Professor of Venereal and Skin Diseases in the University of Vermont.*"

"16 WEST THIRTY-SECOND STREET,
"NEW YORK CITY.

"DEAR DOCTOR,—With regard to the question upon which you have done me the honor of asking an opinion, as to the diagnostic value of the tolerance of the iodides in syphilis, I believe that the idea, which is still quite prevalent, that if a given obscure lesion disappears under the use of the potassium iodide, or if the iodide is tolerated in large doses, that therefore it must be syphilis, is a fallacious and misleading one. Too much stress has, I think, been laid upon the touchstone theory of the action of medicines, and in none more than in the results obtained from the use of mercury and iodide of potassium.

"Putting to one side for the moment those cases of syphilis in which organic lesions have occurred and where no good has ensued from the administration of large doses of the potassium iodide, although they have been well borne, there are other cases where the same tolerance of the drug is shown in which the disease is not syphilitic, as witness cases of cyclitis, gouty affection of the joints, and the like. Here the iodide often acts like a charm; and although the question may be raised whether the lesions are not really due to syphilis, notwithstanding that no history or evidence of the disease exists, still I think that does not invalidate the correctness of the diagnosis, and the maxim '*de non apparentibus*' may be fairly invoked in support. Again, if the effect of the iodide in syphilis is to be taken as a guide or index of the nature of the affection under consideration, how is it that in the earlier stages of syphilis the iodide is not so well borne and is more liable to produce disturbance than when given in the later phases of the disease? And yet such has been my experience, and no doubt the experience of others.

"Taking the reverse of the proposition: idiosyncrasy often acts in such a manner as to preclude the administration of the potassium iodide, and still the disease remains syphilis; yet were the rule—that if the iodide is not tolerated therefore the disease cannot be syphilis—acted upon, the surgeon would be led into error, to the detriment of his own reputation and his patient's welfare.

"In Dr. Wood's paper I see that he also has found that patients showing the early stages of syphilis do not stand the iodide as well as those who are in the advanced stages of the disease, and in so far I agree with him, but there are one or two points upon which I should take issue with him. On the 12th page he writes: 'The production of iodism by small doses of the drug is, however, evidence (not proof) that the patient is not suffering from syphilitic disorder, and in any given case renders it probable that the symptoms are not the result of syphilitic infection.' My opinion is that such a condition would be neither evidence nor proof that the disease was not syphilis, for I have found that small doses of the iodide, and that in syphilitic persons, will more readily produce the toxic symptoms of the drug than when it is administered in large doses,—and by small doses I mean 20 grains or under, and by large ones above that amount. To my mind, therefore, the small dose is no test.

"On page 15 he writes of the slowness in action of the iodides. My own experience points in the opposite direction, for, if I desire to get a quick result in checking the extension of an ulceration or the increase of a gummous growth, my first weapon is large and liberal doses of the potassium iodide; but one point, which should be borne in mind as regards the good to be obtained from the use of the iodide, is that its action is limited, and it is not, to my mind, a curative agent in the treatment of syphilis. It is an adjuvant to mercury and an admirable assistant in many cases, but it is not the right bower, hence what Dr. Wood observed in the autopsy of his epileptic patient—recorded on pages 15 and 16—is what should be expected. He is quite right when he goes on to say that 'more and more has it come to be with me a favorite rule of action in cerebral syphilis, without evidences of cachexia or a distinct history of mercurialization, to begin the treatment with mercury,' but I think he is not so much in the right when he goes on to say 'in such doses as to cause slight salivation, and to maintain this impression for some days or weeks *pro re nata*.'

"In no cases of syphilis do I believe it necessary to induce ptyalism during the course

of treatment; indeed, I am inclined to regard it as a disadvantage rather than a benefit. Nor do I, as does Dr. Wood, consider it necessary to administer the iodide after a mercurial course in order to produce elimination of the mineral, for I believe the mercury is promptly eliminated by itself if the drug be properly administered.

"And now, dear doctor, I think I have stated my opinion on this interesting subject, as you have asked me to do; and with many apologies for my delay in replying, believe me,

"Very sincerely yours,

"F. R. STURGIS,

"*Professor of Venereal Diseases in the Medical Department of the University of the City of New York.*"

"2 WOODSIDE TERRACE, GLASGOW.

"MY DEAR SIR,—In reply to your letter of 6th January, I have to say that, in my experience, the occurrence of the phenomena of iodism depends upon idiosyncrasy. I have often given the iodide of potassium in very large doses, even to the extent of two ounces daily, to non-syphilitic subjects (*e.g.*, to patients suffering from undoubted non-syphilitic psoriasis, and from aneurism without syphilitic antecedents), without any unpleasant symptoms, and I believe that iodism results much more frequently from small than from large doses.

"I have frequently observed iodism set in, and generally soon after the medicine was commenced, in syphilitic subjects, both in the secondary and tertiary stages, and have found it occur just as frequently in syphilitic as in non-syphilitic persons. So that I entirely agree with you in placing no confidence in the diagnostic value of the tolerance of the iodides in syphilis.

"Yours, sincerely,

"T. MCCALL ANDERSON,

"*Professor of Clinical Medicine in the University of Glasgow.*

"To J. WILLIAM WHITE, M.D.
"January 18, 1889."

"NEW YORK, January 2, 1889.

"DEAR DOCTOR,—I consider Professor Wood's statement that 'if sixty grains of iodide of potassium per day fail to produce iodism, for all practical purposes the person may be considered to be a syphilitic,' to be a dangerous generalization, likely to lead to looseness in diagnostic methods, to say nothing of the moral aspect of the question.

"I have neither time nor inclination to discuss the subject here, but my belief is that the whole matter of the tolerance of iodides is personal with the individual, that this personality is not modified by syphilis, but it may and does change in some individuals, and that too without the intervention of syphilis.

"This is my general view, which I could sustain at length, but that I am overborne at this moment with a multiplicity of duties and responsibilities.

"Yours truly,

"EDWARD L. KEYES,

"*Professor of Genito-Urinary Surgery and Syphilology in Bellevue Hospital Medical College.*"

"BUFFALO, January 1, 1889.

"MY DEAR DOCTOR,—I don't think my views on the subject of your recent paper are worth perusal, but I am inclined quite strongly to the opinion that iodism is a matter of idiosyncrasy vastly more than of dose, particularly those severer forms which prevent its administration. Jullien's theory appears to me untenable.

"I see very few cases of purely nervous syphilis, but I should hardly act upon Professor Wood's theorem for a working basis. The cases to which he refers are the uncertain cases, where diagnosis is either difficult or impossible. The disappearance of the symptoms under the iodides (one drachm per diem) might be presumptive evidence in favor of their specific character, but I should be loath to accept the statement that one drachm per day would cause iodism unless the case were syphilitic,—providing that by his expression 'iodism' he meant something more pronounced than a few pustules on the face, etc. And even in case he includes under 'iodism' the slightest manifestation I should consider it too sweeping a statement.

"Perhaps we all view the matter from the specialist's stand-point, but I am inclined to coincide with the views expressed by yourself. I have in mind a few cases which give me a

present reason for my convictions, and yet not one of those I now call to mind was under personal observation for a sufficient length of time to justify any other use of it than to put it in a group with others and try to thus make it of some aid.

"As one who deals with the surgical aspect of these cases oftener than with their uncomplicated drug-treatment, I may be excused from allowing your complimentary request for my opinion to put me in a position where I might find myself without adequate means of defence.

"Sincerely yours,

"ROSWELL PARK,

"*Professor of Surgery in the Medical Department of the University of Buffalo.*"

"DEAR DOCTOR WHITE,—The point at issue between you and Dr. H. C. Wood I take to be, Whether tolerance of the iodides in a given case is, *quoad* syphilis, of diagnostic value? I confess to have shared the widely-spread belief in the affirmative proposition, but in looking over my notes I find no data from which I can glean a positive answer one way or the other. I find two groups of cases in which I have given the iodides in large doses, —cerebral syphilis and aneurism. Certainly patients with the former affection bear, as a rule, very large doses, which may be kept up for months, but I call to mind two cases at least in which this tolerance existed, and in which the lesions proved, post mortem, not to have been specific. On the other hand, I have seen instances of undoubted syphilis in which intolerance of the iodides was a striking and persistent feature.

"Some years ago I was in the habit of giving large doses of iodide of potassium in cases of aneurism, and I have frequently referred to the apparent tolerance of the drug presented by these patients, yet the case which bore for the longest period—three months—the largest doses had not had syphilis.

"I am inclined to regard intolerance as a matter of idiosyncrasy, and should say that, while a large proportion of all patients bear the iodides in full doses for long periods, a small number cannot take even minimum doses without unpleasant symptoms. The 'general impression' which I have had as to the tolerance of the iodides in syphilis has no doubt resulted from the fact that I have given large doses for long intervals in this disease, and in aneurism, so often associated with syphilis. I willingly acknowledge this impression to be worthless in the absence of control-observations of equal number in other diseases.

"Yours sincerely,

"WM. OSLER,

"*Professor of Clinical Medicine, University of Pennsylvania.*"

The extraordinary avalanche launched upon me by my friend Dr. White, I confess at first took my breath; but when I remembered that the root-diggers of the Brazilian forests, finding that a certain drug was being exterminated, quietly substituted the root of a plant apparently selected at random, and that the urino-genital surgeons never perceived any change in the action of the remedy, but continued using the new root under the old name, I was enabled to sufficiently recall myself to say a few words in reply.

I have been very much surprised that some of the writers have thought that I was advancing a novel doctrine or belief. My opinion is exactly as novel as it would be if I said that mercury was useful in inflammation, or digitalis in heart-disease. Glancing over a few of the late lectures of Professor Gowers ought to convince any one that the words "therapeutic test" have become a classical technical expression.

Many of the gentlemen who have written are syphilographers. Such specialists see cases in which the person recognizes that he is suffering from syphilis. In the majority of cases of nerve- and visceral-syphilis, the patient has no suspicion that he is suffering from syphilis, and does not consult the syphilographer, so that the experience of the latter is drawn from general syphilis, and not especially from the gummatous disease which influences the nervous system or the internal viscera. The practical importance of this must be apparent when it is recollected that the idea which I promulgated, that it was the latter stages of syphilis in which the relations of the system to the iodides are changed, receives distinct and positive confirmation at the hands of one or two of my opponents.

To attempt to answer the various letters in detail would be folly,—life is too short; but as

several of the correspondents, and especially my friend Dr. Chapin, have failed to understand my original paper, I propose to formulate my views in a few sentences.

First.—There is no proof that iodide of potassium affects directly, or has direct interference with, the syphilitic virus.

Second.—In the state of the system which occurs in advanced syphilis, there is habitually such a change in the human organism, that iodide of potassium is usually tolerated much more freely than in health.

Third.—That the statement made in paragraph number two is simply a general statement, useful in the prognosis and treatment of nervous or advanced syphilis,—not without exceptions, not a law, but a rule or coincidence of sufficiently wide application to be of practical value in prognosing and treating disease.

I have seen cases over and over again, in public clinics and private consultation, in which the therapeutic test has served me faithfully, and have very many times reached the desired goal, and propose, therefore, to continue to use the old, time-worn probe, believing that a physician is a fool who tells a patient or his friends that the case is syphilis because the therapeutic test is responded to; but that the physician who, in making his decision, fails to give due weight to the test, will fail to succeed in many obscure nervous cases, where he ought to have made out the true nature of the disease.

My opinion in regard to the relations between the iodide of potassium and nerve-syphilis is founded upon a very wide experience, but I must further state that it is consonant with general well-known therapeutic rules or laws. Dr. Brush says, "No disease yields so readily to medicine as late syphilis does to the iodide of potassium, and yet Professor Wood asks us to believe that the very drug which has such a power over the disease is rendered by that disease innocuous to the body in which the disease resides,"—apparently, with the thought that my asking any one to believe such a thing is absurd. If Dr. Brush had been a general practitioner, instead of a specialist in insanity, he would have no doubt known that it is a general law, rule, or coincidence that, when there is a systematic disorder which is curable or removable by a drug, the systematic disorder renders the system comparatively insusceptible to the action of this drug. In severe malarial poisoning, doses of quinine which would overwhelm the nerve-centres of the ordinary individual fail to produce tinnitus aurium; in snake-bite poisoning, pints of whiskey can be taken without intoxication; in syphilitic subjects, mercury is usually required in much larger quantities to cause ptyalism than in the ordinary individual; in delirium tremens enormous doses of narcotics are well borne; in low fevers, much more alcohol is destroyed and much smaller effects are produced by alcohol than in health. Even in local disease the same rule holds to some extent: the irritation of a peritonitis causes the brain not to feel the ordinary dose of opium; a constipation buoys up the man against a purgative; a violent pain or internal irritation prevents the action of a counter-irritant; and so on to the end of the chapter. So far, then, from my belief being an absurdity, the possession of the power by the drug over syphilis is a strong reason for believing that the disease renders the system insusceptible to the drug.

There are certain things in the letter of Dr. Sturgis, outside of the matter which is especially under discussion, of such great practical importance that I feel it a duty to say a word in regard to them.

The problem whether the metal is or is not all eliminated from the system during a long mercurial course is one which is purely chemical, and is capable of an absolute chemical solution as complete as that of the toxicologist in a case of poisoning by arsenic. This solution has apparently been made by various chemists, and from present evidence it *appears* to be positively proven that the mercury is not eliminated from the system: I must hold, therefore, that the man who lets his clinical surmises guide him in the face of direct positive chemical evidence is without excuse. To my thinking, it is the absolute duty of a person who holds the opinions of Dr. Sturgis to make or to have made a series of chemical experiments which shall disprove those made by other chemists, and that, until such chemical proof is furnished, the practitioner of medicine has no moral right to give a mercurial course without following it by the iodide of potassium.

H. C. Wood.

PARIS.

(From our Special Correspondent.)

The Pasteur Institute, as the readers of the THERAPEUTIC GAZETTE probably know, is intended not only for the treatment of hydrophobia cases, but also for the study of microbian diseases in general, voluntary donations from all parts of the world having munificently endowed the establishment. Two of its chemists, Drs. Roux and Yersin, after experimenting with the *diphtheria bacillus* observed by Klebs in 1883, and studied by Lœffler in 1888, have made an important contribution to medical sciences, which has been the event of the month. The chief point of their discovery is, that the microbe is not one that, like most bacilli hitherto observed, causes sickness and death through its multiplying in the economy or some particular organ. The diphtheria bacillus, they have proved, has a fixed habitat, some mucous surface where it develops and always remains; and there it secretes a specific poison, causing all the various symptoms of the disease. Whether the agent is an alkaloid, a diastase, or any other compound has not been ascertained, but Drs. Roux and Yersin have demonstrated beyond possible doubt that the secretion acts chemically, as an ordinary drug or poison might. So, to a certain extent, the bacillus comes within the domain of therapeutics. To begin with the demonstration, many post-mortems on man and animals showed the bacillus to be invariably absent from all parts, except those affected and covered with the characteristic membrane. But this is only a negative proof. The positive has been brought to light in the clearest manner, as will appear hereafter. It was already known that inoculation will produce in pigeons, rabbits, and guinea-pigs an affection closely similar to diphtheria. The first step has been taken successfully to prove that the disease is not only similar but the identical one, with all the symptoms of diphtheria, paralysis included. The inoculations were performed from man to animals, and from animal to animal, by scratching, with a platinum-needle holding the contagious substance, some mucous surface, such as the throat or the vagina. The capital point is that on cultivating the bacillus of human or animal origin, in appropriate media, bouillons will be obtained, which, being freed from all micro-organisms by filtering through unglazed porcelain, will cause, when injected into the veins of animals, all the symptoms of diphtheria during life, and its characteristic lesions observable after death. The quantity of bouillon necessary varies with the kind of animal and the virulence of the preparation. But in no case is there any diphtheria-membrane ever produced on the mucous surfaces. The next thing now is to find a remedy. The nature of the disease being at present better understood than it ever was, hope may be entertained that the cure will be discovered before long. But one good result at all events has so far been secured,—namely, a knowledge of the importance to be attached to local antiseptic applications. The treatment was already sanctioned by practical experience, but now we understand the why and wherefore.

There are degrees in drunkenness, but there is also it seems a sort of gradation in the kinds of stimulants, a scale extending with the progress of science. Alcoholic beverages, the time-honored intoxicants, have of late been supplemented with ether, chloroform, and chloral; and, lastly, with morphine and cocaine injections. And it is seldom a man takes to the more potent drugs before he has abused alcohol. He generally begins with the glass and ends with the syringe, so to speak. From observations made by Drs. Magnan and Chouppe, the *cocainism cases* that came before them had all previously been *morphiomaniacs*. So that we have here the natural scale,—ascending or descending, as you like,—alcohol, morphine, cocaine. The description of the symptoms is instructive. Dr. Magnan had to deal with three chronic cases presenting some notable peculiarities common to all,—namely, a perversion of general sensibility, a sort of hallucination which causes the patient to feel as if he had some foreign body under the skin. One would scrape his tongue to squeeze out little black maggots, perceived by no one but himself, and look into the abscesses to dig out cholera microbes. Another, a pharmacist, would tear up his skin, and with his nails or the point of a pin bring up from underneath quantities of microbes; and the third patient, a physician, would persist in searching under his skin for crystals of cocaine. To which a case may be added observed by Dr. Jennings, wherein the patient was also looking for maggots under his skin. In the three instances now alluded to, the disorders affecting sensibility were the first to become apparent; the hallucinations of sight, hearing, and smell developed only subsequently, and never were so violent as those due to alcohol or absinthe delirium. Analgesia was but slightly noticeable, and only on some points. And, finally, the two first

tients had epileptic attacks, but the third only cramps, which symptoms all disappeared with the suppression of cocaine. Dr. Chouppe, on his side, had also a quota of three cocaine patients, and all were inveterate morphiomaniacs, and, like the three others, began with very large doses of cocaine. But here the similarity ends, none of the second lot having kept on long enough to be exposed to the accidents of chronic cocainism. As figures have an eloquence of their own, it is instructive to know that one of the patients began with 50 centigrammes (8 grains) of cocaine muriate injected in one dose. The two others, less heroic, started with 25 and 20 centigrammes, respectively, far from a despicable quantity. The patients bore well the doses, which would have poisoned, perhaps killed, any one but a morphiomaniac.

The influence of *chronic lead-poisoning* on pregnant women and the fœtus was brought to light in 1860 and 1861 by Dr. Constantin Paul. A new instance, interesting on account of the thoroughness of the observation, has just been related to Drs. Hermann-Legrand and Winter of this city. It occurred as follows: The patient, a woman, aged 27, worked as a compositor in a printing establishment. She had six times been to the hospital before for lead-colics. Five previous pregnancies resulted four times in abortion, and once in a full-term child, who died of convulsions seven months afterwards. On the present occasion she entered Dr. Budin's service at the Charité Hospital, *enceinte* for the sixth time, and seven and a half months pregnant. She recently suffered again from lead-colics, and presented the usual symptoms of the poisoning. Three days after her reception she gave premature birth to a child, but recovered without accident. The husband, it should be added, is a compositor, also affected now and then with the lead-symptoms, but never to any serious extent; no syphilitic taint was observed in him, but a little alcoholism. The child, a boy, was puny, ashy-pale, weighed ten hundred and twenty grammes (about thirty-five ounces avoirdupois), and died after fifteen days. At the autopsy, besides the peculiar appearance and dwarfish size of the kidneys, and a cirrhosis of the liver, the remarkable point was the presence of considerable quantities of lead in the hepatic parenchyma. None was found in the kidneys; they had evidently been impeded in their development, but held no lead. This observation demonstrated that one of the most insoluble of poisons may be transmitted from mother to fœtus, and cause in the child's organs lesions sufficient to render them unfit to carry on life. This much so far may readily be taken for granted, as it is supported by clear evidence. But Drs. Hermann-Legrand and Winter go further, on ground scarcely solid enough. They think that besides hereditary saturnism, there exists quite a series of similar poisonings not only mineral but also organic, and even bacteriological in their origin. For the present it seems safer for us to stop at lead, and, so far as other hereditary poisonings are concerned, to wait for further developments.

A case of no little concern to surgeons has just been decided by the Paris courts. The suit had reference to the mooted question,—namely, the *responsibility of surgeons*, and was as follows: A retired officer, suffering from angular anchylosis of the knee, went for treatment to the Val-de-Grâce Military Hospital, and placed himself under the care of Dr. Poncet, an army surgeon of no mean repute. It may here be explained that the hospital in question is at the same time the seat of the finishing school for young military surgeons and pharmacists. Dr. Poncet advised the straightening of the leg by means of a certain orthopædic apparatus well-known here. Somehow the treatment and its results failed to satisfy the patient, who sued the surgeon for malpractice, and prayed for ten thousand dollars' damages. The issue was well fought on both sides, Dr. Poncet, as an army officer, having the support of the war department's attorney and lawyers. The judge held that, although courts have an undeniable right to examine into facts to decide whether a physician has been imprudent or neglected due precautions, it is not within their province to enter into scientific questions or appreciations of medical practice; that defendant, under advice of two physicians, asked to be admitted to the hospital with the intention of being operated on; that Dr. Poncet only proceeded to the operation after one month's observation of the case, and calling in two other surgeons, with whom he consulted; that the presence during the operation of the apparatus-maker was a fact in favor of defendant, showing carefulness instead of imprudence, as charged by plaintiff; and, finally, that the court cannot appreciate the skill of a surgeon or decide upon the use of a particular instrument. In consequence the court found for defendant, and ordered plaintiff to pay all costs. If the doctor was well defended, the other side was equally well represented, the plaintiff being a man of wealth

and influence. Besides, a thorough preliminary inquiry had been ordered at the request of the plaintiff. The judicial decision has all the more weight that the suit was more fiercely contested.

Dr. Brown-Séquard warmly recommends *carbonic acid as an analgesic*, acting through its effect on the mucous surface of the larynx. It is quite harmless, provided the gas is kept from reaching the lungs, where it might be absorbed. To effect this, carbonic acid should only be inhaled near the end of each inspiration, so that the gas will reach no farther than the larynx and the upper part of the bronchial tubes, whence it will be expelled by the expiration. It is well to gradually accustom the parts to the presence of the gas, otherwise painful dyspnœa might ensue. And, lastly, the inhalations must be kept up for half an hour. With the foregoing precautions it has been possible to produce an analgesis lasting thirty hours, and so complete as to deaden the aching of a very painful lumbago, and to allow the painless massage of a sprain. The administration of carbonic acid, according to Dr. Brown Séquard's process, seems rather long and laborious when compared with other analgesics, but its complete safety may by some be considered ample compensation.

A useful lesson on the *benefits of sanitation* may be drawn from an official report just published by Dr. Lagneau on the death-rate of French soldiers in the colonies. In civil life the rate for men from twenty to twenty-three is at home eight to ten per mille, and nine to eleven in military service. In Algeria, from 1837 to 1848, the rate was seventy-seven, and has now come down to between eleven and twelve, or very nearly the same as at home. In Tunisia the proportion has, under proper sanitary care, come from sixty down to twelve. The Oceanican possessions are the healthiest, eight to nine being the rate for Tahiti and New Caledonia. The French West Indies have improved from ninety-one to twenty per thousand, which is also the present rate for Cochin China, after having reached one hundred and fifteen at the beginning of the occupation. That "precious" Tonquin works the other way; from 1882 to 1885 the rate had come down to forty, but since then, under the influence of cholera, it has reached ninety-six. At La Réunion Island the usual death-rate is twenty-nine per thousand, but when it became the base of operations for the Madagascar expeditions, and received the sick, the proportion rose to seventy and one hundred and thirteen. And, finally, the Senegal colony is the worst of all. The climate is so deadly that the average death-rate from 1832 to 1837 was one hundred and forty-eight per mille; but even there sanitary care had brought down the proportion to seventy-three, or about one-half.

PARIS, February 15, 1889.

Notes and Queries.

A NEW REMEDY FOR CHOLERA.

LOEWENTHAL (*Acad. des Sciences*, Session December, 1888) has concluded a course of experiments undertaken to find an antidote to the virus of cholera. This toxic principle is now, according to the newest pathology, regarded as the product of Koch's cholera bacillus,—a ptomaine, in fact, which is destroyed by cultivation in artificial nutrient media. Loewenthal has found that a pure culture of these cholera bacilli in peptonized broth, previously sterilized, is absolutely inoffensive to animals—as white mice—naturally susceptible to the cholera poison; the bacilli ceasing to produce the noxious ptomaine.

The first aim of Loewenthal's experiments was to render to the cholera bacillus, by a process of the laboratory, the toxic property which it possesses when fresh, but which is lost on cultivation. After many fruitless essays, he believes that he has succeeded with a paste which contains pancreatin, and the composition of which is as follows: fresh pork (muscle), hashed, 500 grammes; pancreas of hog, hashed, 200 grammes; bean flour, 100 grammes; peptone, 15 grammes; grape sugar, 10 grammes; common salt, 5 grammes. These substances, mixed with water or milk, give a soft paste, almost liquid, which is rendered alkaline by a little potash, and then sterilized by hot steam. The cholera bacilli, which by culture have lost their pathogenic properties, are allowed to breed in this artificial paste. They immediately secrete their virulent ptomaine, which, when inoculated in mice, either kills these animals or makes them intensely sick.

By varying the elements of his culture mixture, Loewenthal finally satisfied himself that it is the pancreatic juice which, in presence of albuminoid and peptonized substances, determines the pathogenic or poison-secreting action of the bacillus. All the other cultu

media (peptone-gelatine, agar-agar, bouillon) assure the development of the bacillus, but no toxic matter is produced.

This peculiar action of the pancreatic juice being understood, we have, says Loewenthal, an explanation of the phenomena of cholera in man. The bacilli, after being ingested, escape the stomach, and entering the intestine, produce there, with the help of the pancreatic juice, the same toxic matter which is produced in the pancreatic paste, the latter being a coarse imitation of the contents of the duodenum ; this toxic matter is absorbed and the restoration or death of the patient depends on the quantity of poison absorbed and the resistance of the organism. This experimental fact is in harmony with the anatomo-pathological fact that the bacilli of cholera remain always confined to the intestine, as well as with the "fulminant cases," and the experiments of Nicoti and Reitsch, and those of Koch on animals.

This point being once determined, Loewenthal asked himself if there might not be some substance inoffensive to man which, introduced medicinally, would prevent the development of the cholera poison in the intestine. To determine this, he first experimented with his pancreatic paste, trying various antiseptic agents which he thought might prevent the active functional operations of the bacilli and the genesis of the toxic ptomaine. Any agent, he reasoned, which can accomplish this *out of the body*, might be relied upon to do the same *within the body*, and thus become a specific (preventive and curative) remedy for cholera.

This remedy Dr. Loewenthal announces that he has found in salol, the salicylate of phenol, discovered in 1886 by Nencki, of Berne. This powerful antiseptic is decomposed in the organism by the pancreatic juice, the same agent which renders toxic the cultures of the cholera bacillus in the pancreatic paste. A multitude of experiments have assured him that salol in presence of fresh pancreatic juice is invariably fatal to the cholera bacilli in his laboratory culture-tubes ; and he has determined the quantity which is sure to effectually sterilize his cultures, namely, two grammes of salol to every ten grammes of the paste ; a smaller dose, however (as ten centigrammes), renders the bacilli inactive.

It is known that salol can be taken in pretty large doses (as much as ten to fifteen grammes a day) by man with comparative impunity.

It must be added that the above interesting laboratory experiments, conclusive as they seem to be to their author, who has full faith that he has now found a sure specific for cholera, still lack clinical confirmation, as well as that confirmation which comes from a series of carefully conducted experiments on animals.—*Boston Medical and Surgical Journal*, February 7, 1889.

COLDS AND CLOTHING.

The teaching of modern science and of ancient custom goes to show that heat-production within the body has much to do with the tissue-changes concerned in muscular activity and with healthy digestion. It is conserved by warm and moderate, wasted in evaporation by excessive, clothing. Finally, by a simple nervous reaction, it is increased after the contact of external cold. It follows from these observations that, if we be so clad with comfortable underclothing that surface perspiration is not formed in excess and is rapidly removed, one great cause of chill—sudden evaporation—is done away with. Outer cold, then, provided it is not too severe, only touches, as it were, the spring of the heat-making metabolism, and, exciting an elastic rebound in the chain of vaso-motor fibres, awakens that oxidative action by which every tissue is made to yield its share of heat to the body. This bracing influence is lost wholly or partly to those who are too heavily clothed, and in its place we may have a dangerous excess of surface heat. It is for this reason that we have before protested, as we now do, against the indiscriminate use of the thick and heavy overcoat. We would rather see men in fairly robust condition, especially if young, clad warmly next the skin, and wearing either a light top-coat or none at all. There can be no doubt that the habitual use of great-coats is indirectly accountable for the chills which they are intended to prevent. Were the overcoat worn continually it might attain its object. Its intermittent use, even when ample underclothing is worn, affords no solid guarantee of safety, but rather the reverse. The man of sedentary habits has especial need to remember this. He emerges daily from a warm breakfast-room clothed in his ordinary winter garments, with probably woollen underwear, and over all the heavy ulster or top-coat. After a short walk he finds that the sense of warmth he began with is more than maintained. He arrives at his office or place of business, and off goes the overcoat, though the air of the newly-opened room is as cold as that without, and draughty

in addition. During the day perhaps he travels to and from adjacent business houses wearing only his house-clothing. The overcoat is laid aside till closing time reminds him of the journey home. The frequent result is that somehow between the hours of his departure and return he is chilled. No doubt he would run as great a risk if, lightly clad, he were to face the rigor of a winter day. In this case, however, exercise and habit might do much to develop the power of endurance, and there would, at all events, be less danger of sudden cold acting upon a freely perspiring surface. Woollen underclothing represents a state of healthy comfort intermediate between these extremes, and more resistant to chill than either. In commending its use, however, we do not assert that the influence of age and constitution is to be overlooked. Youth can oppose a power of resistance to depressing agencies which does not reside in the worn-out nerve-centres of a riper age. Similarly, that elastic reaction which characterizes the nervous and sanguine types is not to be looked for in the lax tissues of the lymphatic. The weaker physique naturally calls for fuller protection than the stronger; and any rule requiring the disuse of the overcoat should allow of reasonable exceptions in favor of the old and constitutionally feeble. Unusual severity of weather, especially if associated with night air and the loss of sleep which this implies, is another condition which might well constitute an exception. In such a case we are compelled to add some form of overcoat to the ordinary amount of clothing. Some parts of the body—for example, the chest, throat, and feet—are certainly more susceptible to cold than others. As a useful safeguard, cold or tepid bathing of such parts is in merited favor. The custom so common with many persons, especially women, of walking out in thin-soled boots often plays an important part in catching cold. The progress of time and of rational thought may be expected to bring a more comfortable arrangement by clothing the foot in woollen hosiery and a stouter boot.—*The Lancet*, January 26, 1889.

OPHTHALMIA NEONATORUM.

Dr. Y. Sant'Anna, in a paper read before the Society of Medicine and Surgery of Rio de Janeiro on the subject of ophthalmia neonatorum, expressed a very strong opinion that this affection never occurs except under circumstances where gonococci are present in the maternal passages. He prefers Crédé's prophylactic method of dropping a solution of nitrate of silver into the eyes as soon as the child is born to Gusserow's plan of antiseptic vaginal injections. He would employ the instillations in all cases where the woman is suspected of being a loose character, in multiparæ where the former children have suffered with ophthalmia, where the woman belongs to the very lowest classes, and where the father has had gonorrhœa. In the course of his paper, Dr. Sant'Anna mentioned that in the maternity clinic connected with the Faculty of Medicine in Rio de Janeiro no less than twelve per cent. of the children born were affected with purulent ophthalmia. Notwithstanding his preference for the nitrate of silver prophylactic treatment, he would not use it in all cases indiscriminately, having, as he believed, found that sometimes it was of itself capable of setting up a very undesirable amount of inflammation. As may be supposed, Dr. Sant'Anna's views were pretty severely criticised by some of his auditors, who brought forward cases in which ophthalmia neonatorum had occurred where it was impossible that gonococci should have been present in the maternal passages. Again, it was not generally conceded that the instillation of nitrate of silver could ever produce any undesirable effect.—*The Lancet*, February 2, 1889.

PASTES IN DERMATOLOGY.

Since Lassar introduced into dermatological practice the use of salicylic paste the utility of pastes in irritable conditions of the skin has been abundantly proved. Dr. Gruendler, of Hamburg, has recently made some interesting experiments in Dr. Unna's laboratory on the relative capacity for the absorption of water inherent in various powders which might be used in the preparation of these pastes. He found that carbonate of magnesia had remarkable qualities in absorbing water, and therefore ought to be an excellent ingredient for the formation of a paste. Unfortunately, however, pastes made of a mixture of fat and carbonate of magnesia do not possess the proper consistence. When, therefore, this highly absorbent quality of carbonate of magnesia is desired, it is advisable to combine it with the other powders commonly used. For example, fifty parts of oxide of zinc or starch may be mixed with ten parts of carbonate of magnesia, and the whole rubbed up with fifty parts of fat to form a paste, or as a simple absorbent powder it may be very convenient

used mixed with oxide of zinc.—*British Medical Journal*, December 15, 1888.

POISONING BY CITRATE OF CAFFEINE.

In the *Lancet* for February 2, 1889, MR. T. GERATY reports the case of a lady suffering from migraine, who, at nine o'clock in the morning, before breakfast, took a dessert-spoonful (equal to about two hundred grains) of pure citrate of caffeine in mistake for the granular effervescing form of the drug. Mr. Geraty saw the patient immediately after the accident, when the only complaint made was as to the nauseating taste. The patient was advised to eat a little porridge; an emetic was then given. A quarter of an hour after the reception of the poison there was semi-consciousness, grave depression, extreme pallor, all the muscles completely relaxed, and a decided inclination to sleep; pulse slow, soft, and very compressible; respiration slow and sighing. The treatment adopted was the $\frac{1}{12}$ of a grain of apomorphine, which acted at once and very completely, small quantities of brandy, the recumbent position, and warmth. There was well-marked rigor about an hour after the caffeine was taken. Consciousness was recovered about an hour and a half after emesis, and the faintness gradually passed off.

KAVAINE.

This name has been given by M. LAVAILLE to an alkaloid extracted by him from the kava-kava by the following method, which he contributes to *L'Union Pharmaceutique:* 1000 parts of kava-root, preferably pulverized, are exhausted with alcohol of 60°, and the resultant liquid filtered. The alcohol is recovered from the filtrate by distillation, and the residue evaporated to the consistency of a fluid extract. Add distilled water sufficient to precipitate the resinous matters, filter, and neutralize with ammonia. Agitate the neutralized fluid with ether, and add sulphuric acid drop by drop until the liquid is slightly but distinctly acid. Let stand for twenty-four hours, collect the crystals which will have formed, on a filter, and wash these with frequent changes of alcohol of 95°. The sulphate of kavaine thus obtained is soluble in its own weight of water at 60° F., slightly soluble in alcohol, and insoluble in ether. It appears in prismatic crystals, slightly deliquescent in the atmosphere. The physiological action of the alkaloid is now being

l.—*National Druggist*, February 15, 1889.

ALBUMINURIA AND YELLOW FEVER.

DR. EMILIO MARTINEZ, writing to the *Revista de Ciencias Medicas*, of Havana, on albuminuria in yellow fever, gives it as the result of his experience that the usual recommendation to judge of the gravity of the disease by the amount of albuminuria is untrustworthy, as he has met with cases, of one of which he gives details, where the amount of albuminuria was very considerable, even though the disease ran an exceptionally mild course. In the case in question it appeared as if the poison confined its virulence almost entirely to the kidneys, the liver and other organs being but very slightly affected. A much more important point than the amount of albumen is, in Dr. Martinez's opinion, the amount of urea excreted per diem. This forms a guide to the activity of the oxygenating processes which are going on in the body. If these latter are retarded by the disease the amount of urea is very sensibly diminished. Its quantity thus stands in an inverse ratio to the gravity of the disease, and in this way forms a fairly reliable guide in prognosis.—*The Lancet*, February 2, 1889.

JUNIPER-BERRIES AS A DIURETIC.

According to the Paris correspondent of the *British Medical Journal* for January 12, 1889, DR. GOLDSCHMID, of Fehraltorf, highly praises the inspissated recent juice of common juniper-berries as the best diuretic in children. Attention was drawn to this remedy by Professor J. Vogel, of Dorpat, in his classical handbook on children's diseases. While being most effective, the remedy is exceedingly mild and altogether free from any unpleasant accessory effect. Two or three teaspoonfuls should be given daily, diluted with water and sweetened with sugar. The little patients take it very readily. The author describes a severe case of nephritic dropsy in a girl, aged 7, where the juice rapidly induced a profuse diuresis, a complete and permanent recovery ensuing in a fortnight.

THE WM. F. JENKS PRIZE.

PHILADELPHIA, February 19, 1889.

The first triennial prize of two hundred and fifty dollars under the deed of trust of Mrs. Wm. F. Jenks, has been awarded by the Prize Committee of the College of Physicians

of Philadelphia to John Strahan, M.D., M.Ch., M.A.O. (Royal University, Ireland), 247 North Queen Street, Belfast, Ireland, for the best essay on "The Diagnosis and Treatment of Extra-Uterine Pregnancy."

The writers of the unsuccessful essays can have them returned to any address they may name, by sending it and the motto which distinguished the essay, to the chairman of the Prize Committee, Ellwood Wilson, M.D., College of Physicians, Philadelphia.

The trustees have made arrangements with Messrs. P. Blakiston, Son & Co., 1012 Walnut Street, Philadelphia, for the publication of the successful essay, which will also appear in the *Transactions* of the college for 1890.

JAMES H. HUTCHINSON,
JOHN ASHHURST, JR.,
JAMES V. INGHAM,
Trustees of the Wm. F. Jenks Prize Fund.

LESIONS OF CARBOLIC-ACID POISONING.

In a note of a fatal case of phenol-poisoning, MR. A. G. R. FOULERTON (*Lancet*, January 19, 1889) calls attention to the differences observed, after death, in the mucous membrane from those given by still other writers. He says, "Drs. Guy and Ferrier state: 'The mucous membranes of the mouth, gullet, and œsophagus are pale, corrugated, sodden, and partially detached, and marked by local patches of hyperæmia or capillary hemorrahage.' So also Dr. Stevenson, speaking of carbolic acid, says it 'whitens and shrivels the membranes with which it comes in contact.' Neither of these descriptions would fairly have described the state of things in this case. So far from being sodden, the lining of the stomach had a distinctly stiffened feeling, and its color was a light gray, the œsophageal lining being considerably darker. The mucous membrane of the mouth could alone have been described as pale or white."

EXTRACT OF MALE FERN AS A TÆNIACIDE.

DR. J. O. DE MAN attributes the fact that filix mas has fallen in repute as a vermifuge to the fact that the doses ordinarily employed are by no means large enough. In the *Therapeutische Monatshefte* for January, 1889, he publishes notes of twenty-eight cases in which perfect cure was attained, and in which no relapse occurred, and in only three of which the treatment had to be repeated on account of vomiting. He has given as high as four hundred and fifty grains of the extract in capsules, with satisfactory results. In some cases, however, only one hundred and fifty grains were required, although this was in children of twelve years of age.

THIOL.

Thiol is a new remedy proposed by DR. JACOBSEN as a substitute for ichthyol. It is made by heating the distillate from peat-tar to 215°, with twelve to fifteen per cent. sulphur. By treating this product with strong sulphuric acid the sulpho-acid is produced, which, after purification, is neutralized with ammonia, forming ammonium sulphothiolicum, or simply called thiol. It is soluble in water and in a mixture of alcohol and ether, but not so soluble in either solvent singly. The sodium salt is analogous with the above and contains 12.1 per cent. sulphur. They have the same remedial value as ichthyol.—*American Journal of Pharmacy*, February, 1889.

ANTIPYRIN IN OBSTETRIC PRACTICE.

In the *Northwestern Lancet* for January 15, 1889, DR. TALBOT JONES reports seven cases of labor in which rectal injections of about 30 grains of antipyrin were employed to relieve the suffering from labor-pains. With one exception, he claims that the pain almost wholly ceased, although the uterine contractions continued without alteration or diminution until the birth of the child. He likewise claims that it will produce great relief in obstructive dysmenorrhœa and the after-pains of child-birth. It is to be noted that this is not in accord with the experience of Dr. Huchard as detailed in this issue of the GAZETTE.

UNALTERABLE IODIDE OF POTASSIUM OINTMENT.

A writer in the *Gior. Farm. Trent.* gives the following: Iodide of potassium, white Venice soap, distilled water, of each, 100; glycerin, 600; fresh or benzoinated lard, 300. Dissolve the iodide in the water (using a water-bath) and the soap; add the glycerin, and afterwards the lard. As soon as the lard has melted, stir rapidly and continually and stand the dish in cold water.—*American Journal of Pharmacy*, February, 1889.

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PROPHYLACTIC HYGIENE.

LECTURE VIII.—ON ANTI-VARIOLIC VACCINATION.*

By Professor Dujardin-Beaumetz, Paris, France.†

GENTLEMEN:—If there be any one infectious disease which is calculated especially to alarm populations when it appears among them by the ravages which it occasions, and by the repulsive and formidable array of symptoms which characterize this disease, it is surely smallpox. Confined at first to Asia, smallpox appeared in Europe in the sixth century after the invasions of the Saracens; and since then this malady has continued to make multitudes of victims in all parts of the world. Nevertheless, we shall see that by prophylactic measures certain countries, as Germany, by passing stringent laws, in the way of prevention, have been enabled to effect almost complete disappearance of this affection from their table of mortality. These prophylactic measures consist entirely in the creation in individuals of a soil unfit for the development of variola; this is obtained by variolization and vaccination.

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

† Member of the Academy of Medicine, Physician to Cochin Hospital, etc., Paris, France.

Certain Asiatic nations, basing themselves on this fact of common observation, that persons who have once had an attack of smallpox acquire immunity from future attacks of the same disease, conceived the idea of inoculating smallpox in healthy individuals, and we find that in China and in India these practices have been in vogue from the most remote antiquity. Thus, the Brahmins practised variolization by means of setons which had been soaked in variolic pus, while the Chinese inoculated smallpox by means of crusts from dried pustules, which they placed in the nostrils of persons whom they wished to protect.

From India and Asia these practices passed to Georgia and Circassia. It was by virtue of this variolization that the people of these countries prevented the young slaves, who were sold in the market of Stamboul, from being disfigured by smallpox; and Emmanuel Timoni introduced variolization into Constantinople in 1673. Lady Mary Wortley Montagu, wife of the English ambassador to Constantinople, had the operation of inoculation practised on herself in 1721, and by reason of her influence and authority, variolization was introduced into England, and from thence it became generally adopted in the various countries of Europe.

Vehemently attacked by some, no less vehemently defended by others, variolization none the less constituted a real progress as compared with all the other methods of prophylaxis heretofore proposed. But it is easy to see how variable must be the results of these inoculations, since, in order to preserve from smallpox, it was necessary to inoculate smallpox, and it was impossible to foresee, when once this inoculation was performed, whether the disease would be regular, benign, or grave.

Jenner was one of these physician inoculators. He was born in 1749. He had observed for a long time that the farm-boys who had contracted pustules on their hands by contact with a similar eruption appearing on the teats of cows, were preserved from smallpox. He, then, in 1796, inoculated on a child, whose name has come down to us, the boy Phipps, the contents of some pustules, which a milkmaid, Sara Helms, had acquired in milking cows, and he remarked that this inoculation determined a like eruption in the points inoculated. Then (and this is a mark of the genius which characterized Jenner's discovery), three months afterwards, he inoculated the same child with smallpox. These inoculations remained inactive,—vaccine was discovered. It was not till two years after, in 1798, that Jenner published the results of his discoveries in a pamphlet of about sixty pages, entitled "An Inquiry into the Causes and Effects of Variolæ Vaccinæ."

I shall not take you through all the mazes connected with this history of vaccine for almost a hundred years, and I shall only here take up the most important and practical points belonging to this great question.

One would have thought that the labors of Pasteur, which, by reason of his immortal discovery of attenuated virus, have opened up new horizons to medicine and especially to prophylaxis, would have given us important light on the subject of the Jennerian vaccine. This has not been the case, and we have here one of the most curious points connected with this history. There is no doubt that smallpox is a microbe-disease; there is no doubt that vaccine is an affection of the same nature; and yet, despite the incessant microbiological researches made to elucidate this subject, we are ignorant of the real nature of these microbes, and especially of the points of contact which may exist between the micro-organisms of both these affections. Despite the excellent description which Cornil and Babès have given of the smallpox pustule and of the micro-organisms which it contains, it has still been impossible for us to cultivate these micro-organisms and to obtain vaccine from them.

We already know by the brilliant discoveries of Chauveau, made twenty years ago, that there exists in vaccine corpuscles which may be separated by filtration of the lymph in which they are found. These corpuscles are the only active agents in vaccine virus. These little bodies have been, you may be sure, subjected to all the processes of culture heretofore known, but the results are still very uncertain, and we have not derived any positive datum of knowledge therefrom. For instance, Cohn and Weiggert have succeeded in obtaining an imperfect culture, and Quinst, of Helsindfors, affirms that he has transmitted vaccine by means of these cultures, but these facts have been denied by other observers, so that we are still on this point in complete ignorance.

So, then, notwithstanding the incontestible progress which has been made these late years in this great subject of attenuated virus, we find the origin of vaccine still under dispute. Jenner, as you know, had contended that cow-pox does not spont-

neously break out in the cow, but that this disease is inoculated by the hands of individuals who surgically treat the feet of horses on which are developed sometimes certain vesico-pustules, an affection to which Jenner gave the name of *grease*. This disease is called in France *eaux-aux-jambes*. Jenner, as you see, attributed to *horse-pox* the origin of vaccine.

This view seems to-day to be abandoned, and, if we may trust the experiments made by the Lyonnese Commission, under the direction of Chauveau, vaccine is really cow-pox, and not horse-pox.

There is still a more plausible view, which was once defended by Depaul in a memorable discussion which took place at the Academy of Medicine in 1863,—namely, that cow-pox or horse-pox is in reality only the smallpox of the animal. This view would fit in perfectly with the new notions which we to-day hold respecting attenuated virus, and it was quite logical to think that vaccine was nothing but smallpox, which, in passing through another organism, a process which we to-day effect experimentally for a great number of virulent affections, becomes enfeebled and attenuated in its properties, and then, when transmitted back to man, it constitutes vaccine.

Unfortunately, this is not the case. Despite the experiments made by Sunderland in 1831, who covered the teats of cows with smallpox scabs; despite the researches of Theile, in Russia, who inoculated smallpox in the cow, then took lymph from the eruption to transmit the disease back to man; despite the labors of Cely and of Leonard Vogt, of Hamburg, this question appears to be settled in a manner directly contrary to our previsions, and constantly smallpox gives smallpox and vaccine vaccine.

It seems, then, to be decided that these two diseases are clearly separated, the one from the other. Nevertheless, certain experimenters have not lost courage, and have thought that, perhaps, one might by special processes attenuate the virus of smallpox so as to make vaccine of it. Thus it is that some have proposed to mix milk with variolic virus, and so form a lacto-variolous virus. Papillaud takes a different tack, and proposes a double vaccination. He would have us commence first with vaccine, and then practise variolization. All these processes seem to be abandoned, and the medical profession has returned to the point from which it started,—namely, to the employ of the Jennerian vaccine.

As is the case with all virulent diseases, the virulence of vaccine augments or diminishes as it passes from one organism to another. In man, for instance, the successive passage of vaccine from man to man during long years diminishes the activity of the vaccine. Hence it is that governments award considerable prizes for cows affected with kine-pox, the natural kine-pox, whereby vaccinators may be able to renew their supply of virus which shall when inoculated display a new vigor and a new activity. When, on the other hand, you transmit the vaccine of the cow to the cow, it seems that its virulence increases. In animals, the vaccinal pustules take on a great development and furnish a considerable supply of vaccine.

If we add, that by virtue of reverting to the cow for our supply of lymph we avoid one of the dangers of vaccine,—to wit, the inoculation of syphilis,—you understand why animal vaccine has become so popular, and we may say to-day that in all the countries of Europe this kind of vaccine is generally preferred, and in Germany it is universally resorted to.

The idea of cultivating vaccine on the heifer is far from being of recent date, and from the time of the first experiments on vaccine we have seen this process brought into usage. It was put in practice in 1800, at Rheims, by Duquémel, by Valentin at Nancy, then at Naples by Trojà in 1805, and by Galbati in 1810.

This animal vaccine includes two kinds of virus. In the one it is the cow-pox, which has been inoculated from cow to cow. This is known as Megry's vaccine virus, of which Chambon and Lannois have been the principal propagators in France and Martin in America. The other kind is human vaccine which has been made to pass through the cow, and which constitutes retrovaccine. Whichever kind of virus you may have to do with, it none the less remains a fact that the organism of the heifer augments the virulence of vaccine, and there is general agreement that even human vaccine is regenerated in passing through the cow.

I cannot here enter into all the details of animal vaccine, but must refer you for full particulars to the excellent "Manual of Animal Vaccination" by Dr. Vaillard. I must, however, allude to the behavior of the vaccinal eruption in the heifer.

The fifth day after inoculation, a limpid, perfectly transparent liquid appears at the point of inoculation. This transparency con-

tinues during the sixth day, but after this the liquid becomes slightly opaque, and on the seventh day the purulence is well marked, and the pustule begins to be covered with crusts. It is during the fifth and sixth days that the vaccine ought to be taken; this is the time of its greatest activity.

When you make use of human vaccine, the period for taking vaccinal lymph is a little later, and it is the sixth or seventh day, ordinarily, when the vesicles are ready; but after the seventh day the vesicle becomes purulent, and the contained exudation loses its active properties.

When you take your vaccine from children, you should be perfectly sure as to the state of the child's health, and especially see to it that the parents are healthy. Choose only infants six months old, that are robust and well, and free from every communicable disease. You should inquire into the sanitary condition of the father and mother, for if vaccinal syphilis be rarely observed, it none the less exists, and the facts noted in Bretagne, at the Academy of Medicine, and in Algiers, are in this respect indisputable. This possibility of the inoculation of syphilis, and the necessity of a rigorous examination of children and of their parents, make physicians more and more inclined to abandon the employment of human vaccine. Lastly, the establishment of institutes of vaccine in the different countries of Europe has been another cause of the abandonment of the humanized vaccine.

But before taking up this subject of vaccinal institutes and of the processes put in usage for the preservation and propagation of animal vaccine, I must allude briefly to the phenomena produced by the inoculation of vaccine in man.

During the first three days which follow the scarification, nothing is observed around the inoculated point; this is the period of incubation. About the fourth day there appears a papular elevation, surrounded by a slight induration. The fifth day the vesicle is well formed, and the sixth you perceive an umbilication at its centre, and the lymph which this vesicle contains is clear and transparent. The seventh day the vesicle is at its acme. From this time maturation commences; the liquid becomes opalescent; a scab forms on the surface of the pustule; this scab finally separates, leaving a well-marked cicatrix, which shows that the individual has been vaccinated. This vaccinal eruption may present certain anomalies and complications, which are described with great care in all the treatises on vaccine. I would refer you especially to the articles under this head in the Dictionaries of Jaccoud and Dechambre.

Now that everybody seems to be agreed in the advantages of vaccination and revaccination, attempts have been made to establish in the great centres of populations institutes for the supply of vaccine matter. These vaccinal institutes tend to become more and more general; there is one under the special supervision of our Academy of Medicine; there are others at Lyons and Bordeaux; and recently quite an animated discussion was carried on between these institutes with regard to the superiority of the means employed for the conservation and propagation of vaccine. In foreign lands these institutes are also numerous. We see them established in Germany, Switzerland, and Italy. All these establishments employ animal vaccine. I have just told you the advantages of this kind of vaccine, which has more activity than the humanized virus, and is theoretically safer on account of the impossibility of the transmission of syphilis thereby. Before proceeding further, I must utterly deny the proposition so often put forth that because the heifer may be afflicted with tuberculosis it is possible to transmit at the same time vaccine and tuberculosis. This is an assertion absolutely unwarranted; no experimental fact has been alleged in its support; therefore I think that we ought to reject as utterly unfounded the possibility of the transmission of tuberculosis by vaccine. Moreover, to remove all likelihood of such transmission, usage is made at our vaccine institutes of animal virus only after the animal from which it is taken has been killed and the perfect soundness of the viscera has been noted.

But where there has been no little dispute, is respecting the question whether we ought to perform vaccination directly from the animal to man, or whether, on the contrary, vaccine which has been well preserved may not do as well. Some, for instance, affirm that inoculation direct from the animal to man is a guarantee of the success of the operation. Others, on the contrary, contend that there is no need of the transfer of lymph directly from the beast to the person undergoing inoculation, and that this should be looked upon as a barbarous procedure, especially when we take into consideration that vaccine which has been kept with care loses nothing of its active properties.

If you will refer to the very precise experi-

ments undertaken at Brussels in 1884 by the health inspector of the army, respecting animal vaccine, whether in a fresh (living) state, or after having been kept for some time, you will see that the advantage always remains on the side of the preserved vaccine, and out of fourteen thousand inoculations practised from 1864 to 1885, these are the proportions obtained with the two kinds of vaccine:

Preserved Vaccine.—Thirty-eight per cent. of good pustules, sixty-one per cent. of successes (including the false pustules).

Living Vaccine.—Thirty-three per cent. of good pustules, forty-eight per cent. of successes (including the false pustules).

Such are the figures given by Teteca, physician to the regiment of Brussels.*

If I add that vaccinations made with the living animal lymph take three times as long as those made with preserved vaccine, and that (what is a matter of special importance) by dint of the drying and preservation proprietors are able to furnish and send to long distances great quantities of vaccine, you will understand why it is that the advocates of the dried animal vaccine far outnumber those of vaccination directly from the living animal. It remains for me now to indicate what are the best methods of preservation of animal vaccine.

One of my pupils, who has given especial attention to the conservation of vaccine matter, Dr. Ciaudo, of Nice, has made known the methods which, in his judgment, are most efficacious for this end.† We have abandoned those capillary tubes with which you are all familiar. Here the vaccine is in liquid form and kept in the bulbous central part of the tube; the ends are drawn out fine and hermetically sealed. This was a costly way of vaccinating, only adapted to cases where there were many individuals to vaccinate at one time.

Another way formerly popular, but which speedily went out of vogue, was that of glass plates coated over with vaccine; the access of air is too free, and the vaccine soon spoils. Under this form the Academy of Medicine used to export vaccine; the failures attending this method of employing animal virus were frequent.

Instead of glass plates, much use has been made of ivory points which are coated with vaccine, and passed back and forth over scarifications made in the skin. Varlomont, to whom we are indebted for a fine treatise on vaccine, has been long the earnest advocate of these ivory points.‡

This is a method which, though superior to the glass plates, presents still serious disadvantages, and there seems to be a disposition at the present day to employ the vaccine in the form of powder, or, what is better, in the form of pulp.

Verardini was the first one to counsel vaccinal powder. He dried by the aid of the pneumatic machine the vaccinal lymph, and reduced this to powder. This powder is kept from the air, and answers a good purpose for vaccinations. Its inoculation is, however, attended with some difficulty, hence most persons prefer the glycerized pulp. A homogeneous paste is made with vaccinal lymph and glycerin, and the scarificator or lancet is dipped into this pulp. This paste keeps very well for a long time, it is easy of transportation, and seems to retain the virulent properties of vaccine, and be just as active as if taken directly from the heifer.

There are many processes for obtaining this vaccinal pulp,—that employed at the Vaccinal Institute of Milan, that of Pissin, of Leipsic, that of Pfeiffer, of Weimar, that of Varlomont, and that of the Institute of Lyons. This is the way this glycerized pulp is prepared in the army. I quote from the official circular:

"Scrape out the vaccinal vesicles of the heifer with a sharp-cutting curette, and deposit the pulp thus obtained in a glass mortar scrupulously clean. Add an equal quantity of chemically pure neutral glycerin, and triturate together to a homogeneous paste, about the consistence of honey; there should be no lumps. Put the pulp into sterilized glass tubes, cork tightly, and seal with sealing-wax."

According to the figures given by Hubert, one heifer will furnish 4.50 grammes of pure pulp, enough to vaccinate a thousand men, at a cost of .049 franc (or less than a cent) per man (Vallin). If you make use of humanized vaccine taken from infants, the cost per man will be .237 franc (or a little less than five cents).

It remains for me now, in concluding what pertains to vaccination, to say a few words as to the manner of vaccinating. Many differ-

* Teteca, "Animal Vaccine Preserved and Living" (*Congrès International de Vienne*, 1887).

† Ciaudo, "A Comparative Study of Animal and Humanized Virus." Paris, 1882.

‡ Varlomont, "Treatise on Vaccine," Brussels, 1883, etc.

ent modes have been employed. There is, first of all, the mode which is most natural,—namely, that of friction, counselled by Morlamm; then that of the application of the vaccine to a blistered surface,—a process to-day abandoned. Bourgeois advised to insert the vaccine under the skin, and to practise a real hypodermic injection of the virus. Then, again, there is the method of inoculation by pricking, which is done either with an ordinary needle, or with the canulated needles of Depaul or of Mathieu.

The most common process is that which was recommended by Sutton, and which consists in pricking up the epidermis with the point of a lancet, and inserting there the vaccinal virus. This is the method employed by Chambon, who makes use of real cataract-needles. It has also been proposed to make incisions, more or less deep, with a lancet, or to practise light scarifications. This last process deserves to be retained, and when you have to do with persons refractory to vaccine, it is a good plan to vaccinate by scarifying the place which you wish to inoculate, and rubbing well in the vaccinal lymph.

The same process may be employed when you desire, by means of these vaccinations, to cause the disappearance of certain birth-marks. We have here, as you know, a method very much in vogue for the treatment of those disfiguring *nævi materni*, and which often gives good results. Lastly, apparatuses more or less complex have been invented, such as Monteil's scarifier, the vaccinator of Varlomont, the more complex instrument of Burcq, etc.

Whatever method you may employ, you must always avoid hemorrhage in vaccination. When there is a flow of blood, it washes away the virus, and thus prevents the vaccine from taking. You should also bring the vaccinal virus well in contact with the denuded derm, and this is what gives to the method called Suttonian a very marked advantage over the method by pricking.

Depaul practised for many years at the Academy of Medicine these inoculations by pricking, using for this purpose a needle, which even now bears his name; and if this process is very rapid and but little painful, it is often inefficacious, for the needle in traversing the tissues, does not always deposit in the derm the virus with which it is charged, so that the operation may have to be repeated several times. There is, finally, a precaution, which, unfortunately, is too often neglected,—namely, the taking care to have the instruments antiseptically clean when you have to perform numerous vaccinations. In such cases you need to have a sufficient number of lancets to enable you, when you have inoculated one individual, to plunge the lancet then used into a disinfecting solution, and have it thoroughly aseptic before charging it anew with vaccine to vaccinate another individual.

It must be borne in mind that if our government has not made vaccine obligatory in this country, it, nevertheless, requires that all soldiers shall be revaccinated on reporting themselves for duty; and as to-day all Frenchmen have to pass through a term of military drill, we may affirm that all male adults are vaccinated or revaccinated from the age of twenty to twenty-one years. As, on the other hand, the Minister of Public Instruction also requires that revaccinations shall be periodically practised on all the pupils of the public schools, you will be called upon to make these vaccinations on a great number of individuals, and for that reason you ought to employ the most rapid and sure methods to obtain the best results.

The place generally chosen for performing vaccination is the upper part of the arm. To avoid the marks occasioned by the vaccinal cicatrices, and which are something of a disfigurement for women, it has been proposed to vaccinate on the leg, or even on the lateral parts of the thorax. You should not vaccinate children on the leg, except in compliance with the express wish of the family. In the very young child the pustules are very likely to be irritated by the urine and fæcal matters, and this enhances the disagreeable effects of the operation. In the adult, friction of the arm and the efforts of walking, added to the inflammation which these scarifications always develop, augment the intensity of the vaccinal symptoms, and a rest of several days in bed is often necessitated. I believe that, if you would avoid the vaccinal marks on the arm, there would be no objection to performing vaccination on the sides of the thorax. I do not know, however, that this practice has ever been adopted.

It is hardly needful that I should take this occasion to insist on the utility of vaccination. The conflict which has been going on between the advocates and opponents of vaccine ever since Jenner's discovery, a conflict which was still vehement during the last years of his life, seems to-day to have ceased

with the complete rout and defeat of the anti-Jennerians. The cause of this defeat is to be found chiefly in this great fact of every-day observation in our neighbor country, Germany,—namely, that by the rigorous enforcement of a law compelling vaccinations and revaccinations, the Germans have been able to stamp out smallpox in that great empire, and this fact is so demonstrative, that you will permit me to dwell at some length upon it. I shall tell you why this law has been adopted, and how it is applied. We find in this study numerous lessons by which our own country might greatly profit.

At the end of the Franco-Prussian war the German army brought home the smallpox, and from 1870 to 1874 this disease made terrible ravages throughout the entire German empire, and the mortality from this disease attained the yearly average of 252.27 per 100,000 inhabitants. In presence of this mortality from smallpox, always increasing, the Medical Society of Königsberg submitted to the Reichstag the draft of an ordinance to render vaccination and revaccination compulsory. This law was adopted April 8, 1874, and was fully carried into effect throughout the whole German empire, April 1, 1875.

This law specifies that vaccination shall be obligatory on all children during the first year, and that revaccination shall be performed on all children that have passed their twelfth year. The fathers, the tutors, or guardians of children who do not comply with this statute are subjected to a fine not exceeding one hundred and fifty marks (one hundred and eighty-seven francs, or thirty-seven dollars), or to imprisonment from one to fifteen days. The law specifies the vaccine which is to be used, the methods, etc.

In the discussion which preceded the adoption of this law, the opponents of vaccine made one supreme effort, and urged in turn the possibility of the inoculation of syphilis, of erysipelas, the transmission of tuberculosis, typhoid fever, of diphtheria, of measles, and of scrofula. Save in the case of syphilis and erysipelas, the opponents of vaccine did not furnish one positive fact to support their contention, and, as for syphilis, it was shown that, in order to avoid the possibility of transmitting this disease, all that was necessary to do was to have recourse to animal vaccine. As for infectious erysipelas, which is transmissible by inoculation, care in antisepsis sufficiently protects against communicating this disease.

Dr. Jeunhomme,* who has given us very precise information as to the state of vaccination and revaccination in Germany, has shown us the great advantages which this country has derived from the enforcement of this law, by proving that, in less than thirteen years, the German empire has caused the mortality from smallpox to disappear, and to such an extent that the mortuary records have suppressed the name of smallpox from their tables. Would you see the statistics that bear out this affirmation? I will cite some of the figures.

Pepper affirms that there has not been a single death from smallpox in the German army since 1874. In the city of Berlin the disease has been virtually stamped out, as you can see by glancing over the two following tables, in which is compared the mortality from smallpox per 100,000 inhabitants from 1880 to 1888:

MORTALITY FROM SMALLPOX IN PARIS AND BERLIN PER 100,000 INHABITANTS.

Years.	Paris.	Berlin.
1881	44.0	0.80
1882	28.0	4.74
1883	20.0	0.43
1884	3.3	0.33
1885	3.0	0.00
1886	0.9	0.00
1887	9.0	0.00
1888	11.0	0.00

We may appeal to figures equally convincing from the statistics of other countries. Thus, at Zurich, the law rendering vaccination obligatory has not been enforced since 1883, and the annual mortality from smallpox has reached the figure of 80 to 85 per 100,000. In our own country even, where vaccination is compulsory in the army, the mortality in 1885 was but 6 per 100,000 soldiers, and to-day it is absolutely *nil*, as in Germany, and this has come about since the new regulations came into force which compel vaccinations and revaccinations in the army.

Since November 21, 1888, animal vaccine has become obligatory in the army, and five centres of supply have been established,—one at Paris, one at Chalons, one at Bordeaux, and two in Algiers. I must refer you for further information under this head to the very complete article on the subject in the *Bulletin Officiel du Ministre de la Guerre*, and to Vallin's communication "On Animal Vac-

* Jeunhomme, "On Vaccination and Revaccination in Germany" (*Revue d'Hygiène et de Police Sanitaire*, October 20, 1888).

cine as employed in the Army," published recently in the *Revue de Hygiène et de Police Sanitaire.*

But Ritchie has furnished regarding the protective benefits of vaccination still more satisfactory statistics. He takes what has happened at Sheffield, where, out of one hundred thousand children under ten years of age, there were ninety-five thousand that had been vaccinated, and five thousand that had not been vaccinated. The ninety-five thousand vaccinated furnished one hundred and eighty cases of smallpox and two deaths. The five thousand not vaccinated gave one hundred and seventy-two cases of smallpox and seventy deaths. "If all the children of Sheffield," says Ritchie, "had been vaccinated, there would have been two hundred cases of smallpox and a little more than two deaths. On the other hand, if none of these one hundred thousand children had been vaccinated, there would have been three thousand three hundred and seventy-seven cases of smallpox and thirteen hundred and thirty deaths,—*i.e.*, a mortality six hundred times as great."

Are the benefits of vaccination likely to last all through life. This question must be answered decidedly in the negative, and it seems that every ten years this acquired immunity tends to become feeble or disappear, hence the necessity of revaccinations. It seems, too, that as people advance in years, the liability to contract smallpox diminishes. In an interesting communication made to the Society of Practical Medicine, Toledano has shown that from the point of view of vaccine it is not so, and that the revaccinations practised at the Hôpital des Invalides had given as favorable results in the aged as in young people. You can judge of this by the following figures:

Years.	Successes.		Revaccinations.		Per cent.
20 to 30	2	out of	6	=	33
30 to 40	5	"	10	=	50
40 to 50	14	"	17	=	82
50 to 60	21	"	35	=	60
60 to 70	41	"	60	=	68
70 to 80	31	"	37	=	84½
80 to 90	10	"	13	=	77
90 to 100	1	"	1	=	100
Total	125		169		70

However, the results obtained by the vaccinations are extremely variable and oscillate between forty and fifty per cent. of successes, and this is the consequence of the method employed in vaccinating and the kind of vaccine that is used. Dr. Anthony, who has given this question much consideration, has obtained in the army seventy per cent. of successes, and he thinks that we ought to attribute this result to the multiplicity of punctures which he makes. A result still more remarkable has been obtained in the army by André, who, out of one hundred and ninety men revaccinated, has had one hundred and eighty-two successes. Vallin, in the third corps of the army, has obtained an average of forty-six per cent. of successes.

It remains for me to discuss here the value of the number of vaccinal inoculations from the point of view of the immunity acquired by vaccination. It seems that the more numerous and prominent the vaccinal cicatrices are, the greater is the immunity. The table given by Marston, who sums up the results of his observations of six thousand vaccinated subjects admitted to the London Smallpox Hospital in twenty-five years, is in this respect very interesting. In vaccinated subjects who had no appreciable cicatrices, the mortality from smallpox was twenty-one per cent.; with one cicatrix, seven and a half per cent.; with two cicatrices, 4.12 per cent.; with three cicatrices, 1.7 per cent.; with four cicatrices and more, .07 per cent. It results, then, from this that we ought not to be satisfied with one vaccinal scar, and that we should try and obtain three or four, in order to feel sure that a real immunity has been conferred on the individual.

Oppert had previously obtained similar results. These are his figures:

Number of cicatrices.	Percentage of grave cases.
0	82
1	34
2	25
10	13
11	5
12	4

With reference to these cicatrices, Paul Lalagade, of Albi, who has written a work entitled "A Practical Study on Vaccinal Cicatrices," has affirmed that the greater one's aptitude to take vaccinal disease, the greater the aptitude to take the kine-pox disease again; in a word, that the more numerous and well characterized the previous kine-pox marks, the more susceptible the individual will be to the effects of a new vaccination, and Lalagade bases his statements on the following statistics, which seem to be demonstrative:

Previous cicatrices.	Complete successes.	Vaccinal efflorescence.	Negative results and spurious vaccinations.	Total of revaccinations.	Percentage of complete successes.
1	101	113	567	781	13
2	152	109	623	884	17
3	288	117	1025	1,430	20
4	669	249	1535	2,453	27
5	829	232	1627	2,688	31
6	1048	276	1224	2,548	41
7	46	21	25	92	50
8	87	19	66	172	51
Total	3220	1136	6692	11,048	29

Such, gentlemen, are the considerations which I desired to present relative to vaccine and vaccination. Although most of you have kept posted in all the scientific aspects of this great question, I thought it well to bring before you again the principal points, and to insist especially on the necessity which is imposed on our country of adopting a law rendering vaccinations and revaccinations obligatory.

But the benefits which have been derived from the Jennerian vaccine against one so formidable infectious disease are not limited to variola, and we shall see that by virtue of attenuated virus, we may create other vaccines which shall confer on man a real immunity against other infectious diseases. This will be the subject of my next lecture.

CHEMICAL AND CLINICAL EXPERIMENTAL RESEARCHES ON THE SALICYLATE OF MERCURY.

By W. C. Caldwell, M.D., Chicago, Ill.

FOR simplicity the following order of presentation will be used:

I. Formulæ of the salts.
II. Physical and chemical reactions.
III. Report of clinical experiments; and,
IV. Physiological and therapeutic reactions.

I.—FORMULÆ OF THE SALTS.

Because mercury forms both mercurous and mercuric compounds, because salicylic acid has two atoms of replaceable hydrogen, and for other reasons, there are a number of salts of salicylic acid and mercury. There is yet difference of opinion as to the formulæ, but the following may be mentioned:

1. Mercurous salicylate,

$$C_6H_4<\begin{matrix}OH\\CO_2\end{matrix}-Hg-Hg-\begin{matrix}OH\\CO_2\end{matrix}>C_6H_4.$$

2. Neutral mercurous salicylate,

$$C_6H_4<\begin{matrix}O\\CO_2\end{matrix}-\begin{matrix}Hg\\Hg\end{matrix}-\begin{matrix}Hg\\Hg\end{matrix}-\begin{matrix}O\\CO_2\end{matrix}>C_6H_4.$$

3. Mercuric salicylate,

$$C_6H_4<\begin{matrix}OH\\CO_2\end{matrix}-Hg-\begin{matrix}OH\\CO_2\end{matrix}>C_6H_4.$$

4. Neutral mercuric salicylate,

$$C_6H_4<\begin{matrix}O\\CO_2\end{matrix}-\begin{matrix}Hg\\Hg\end{matrix}-\begin{matrix}O\\CO_2\end{matrix}>C_6H_4.$$

These four above salts I have made and described in the *Western Med. Rep.* (Chicago), October, 1888.

5. Neutral mercuric salicylate, Heyden's formula, $C_6H_4<\begin{matrix}O\\CO_2\end{matrix}>Hg$.

6. Neutral mercuric salicylate, Fischer's formula, $C_6H_3<\begin{matrix}OH\\CO_2\end{matrix}>Hg$. In this there is a rearrangement of the atoms in the molecule of Heyden, but it is defective, as the radical OH is univalent, instead of bivalent, as represented in the graphic formula of Fischer.

II.—PHYSICAL AND CHEMICAL REACTIONS.

In this paper the consideration of the physical and chemical reactions of these salts will be confined entirely to those which will aid in explaining its action on the animal organism in health and disease, and when the system is saturated with other drugs, and also such reactions as are liable to occur in compounding prescriptions where the physician may desire to have other drugs in the same prescription with the mercurial salt.

There is great difference in the reactions of the acid and neutral salicylates of mercury. The acid salicylates behave very much as the mineral salts of mercury, while the actions of the neutral salicylates are entirely different and directly opposite to the phenomena of these salts. Mercurous salicylate, like calomel, is insoluble in water, and forms a black precipitate with alkalies. Mercuric salicylate is slightly soluble in water, freely soluble in water acidulated with hydrochloric acid, freely soluble in citrate of potassium (possibly the citro-salicylate of mercury and potassium is formed), and, like the bichloride, it forms a yellow precipitate with the alkalies.

I have not studied the reactions of neutral mercurous salicylate. The neutral mercuric

salicylate which I have made produces an entirely different set of reactions from those just described. It is insoluble in hydrochloric acid. Instead of being precipitated by the alkalies, it is freely soluble in them, which is quite a contrast with the mercurous and mercuric salicylates and the mineral salts. It is not soluble in citrate of potassium, like the mercuric salicylate. The remainder of the experiments, physical, chemical, and clinical, which will be described in this paper, were all made from the same bottle, obtained from Lehn and Fink, and is said to have been manufactured by Scherring, Germany, according to Heyden's formula, $C_6H_4<\overset{O}{CO_2}>Hg$. I am particular in stating the kind I have used in these experiments because the experiments would be worthless if the preparation was not known.

Only a few reactions have been investigated, and these may be arranged as follows:

1. *With the Mineral Salts of the Heavy Metals.*—When a solution of the salicylate and the tincture of the chloride of iron are poured together, there is formed bichloride of mercury and a black precipitate of salicylate of iron. This is cleared up by the addition of liquor ammonii citratis by forming citro-salicylate of iron and ammonium, but, of course, the mixture is objectionable on account of the bichloride; hence it should not be prescribed with the tincture of iron. With the sulphate, and also the pyrophosphate of iron, there is chemical action, hence it should not be prescribed with them. When combined with the sirup of the hypophosphites of iron, manganese, strychnine, quinine, etc., in an acid solution, there is precipitation of the bases. With sirup of iodide of iron a black precipitate appears, and with sirup of iodide of manganese, a light precipitate. These both clear up by adding liq. ammonii citratis, but, of course, are objectionable.

2. *With the Organic Salts of the Metals.*—When a bicarbonate solution is added to an aqueous solution of tartrate of iron and potassium, or citrate of iron, there is no chemical action. After standing several days the mixture is still clear. The carbonate of iron is insoluble, and no chemical action occurs when brought in contact with the salicylate in solution of bicarbonate of sodium. It may be also mentioned here that with Fowler's solution of arsenic there is no precipitate, nor does there appear to be any immediate chemical change.

3. *With the Carbonates and Bicarbonates of the Alkalies.*—It is very freely soluble in the carbonates of potassium, sodium, and ammonium. It is also soluble in the bicarbonates, but not so freely; however, the bicarbonate being milder, is a more convenient vehicle for its therapeutic use. After standing several weeks the bicarbonate solution decomposes.

4. *With Hypophosphites.*—With hypophosphite of lime a light precipitate occurs; with potassium and sodium none.

5. *With Halogen Salts of the Alkalies.*—It is very freely soluble in iodide of potassium. This appears to be a physical process, but in time chemical change occurs and iodide of mercury is formed. As the dose is 1 grain three times daily, it would be a serious matter if it were converted into the biniodide in the animal organism, hence to determine this a number of experiments were made, which will be described later.

Since the salicylate and its albuminate are very freely soluble in iodide of potassium solution, it may be that in this way it promotes the absorption of the mercury.

It is freely soluble in the chlorides, though less than in the iodides and more than in the bromides. It is more soluble in chloride of sodium than in chloride of ammonium.

The solution of chlorides, as with the iodides and bromides, is physical, though in time chemical change occurs. Lime-water added to the chloride solution at first or after four days does not throw down a yellow precipitate, as would occur if bichloride were present. But a copper wire heated in it is soon covered with mercury, which does not occur in a carbonate solution acidified with salicylic acid. This suggests the probability that the sodium chloride renders the salicylate less stable, and hence it may be that the sodium chloride in the digestive tract and blood may convert it into the bichloride. If it is liable to be converted into the bichloride, as calomel is by large quantities of common salt, it would be unsafe to exhibit two or three grains daily without keeping the patient under close observation.

I have not made any clinical experiments by administering large doses of salt with one grain of the salicylate three times daily.

6. *With Acids.*—It is insoluble in the vegetable acids. In cold dilute nitric acid there appears to be no immediate change, but after boiling a few minutes the dilute nitric acid decomposes it. It is dissolved with great difficulty in boiling dilute sulphuric acid. After boiling in dilute hydrochloric acid for several minutes, the filtrate does not yield bichloride

of mercury. The concentrated acids decompose it at once.

III.—REPORT OF CLINICAL EXPERIMENTS.

These experiments were made to determine the first-contact and elimination-contact actions of the neutral salicylate of mercury in health on—

1. The stomach, manifested by nausea and loss of appetite.
2. The duodenum, manifested by loss of appetite.
3. Lower intestine, manifested by diarrhœa.
4. The buccal cavity, manifested by salivation.
5. When iodide of potassium is given.

These experiments were performed by Dr. Ludwig Hektoen, house physician, Cook County Hospital. The patients were up and around the wards assisting the nurses.

To Class 1 the medicine was given in bicarbonate solution with twenty grains of bicarbonate of sodium, one hour before meals. Two adult males, ½ gr., t. i. d., for seven days; then ½ gr., t. i. d., for three days; then 1 gr., t. i. d., for ten days; no disturbance at all. Four adult males, ½ gr., t. i. d., for seven days; no symptoms. Three adult males, ⅝ gr., t. i. d., for eight days; no disturbance. One adult male, ½ gr., t. i. d., for four days, then ⅝ gr., t. i. d., after ninth dose of which began to suffer from salivation, nausea, and diarrhœa.

To Class 2 the medicine was given in pill, one hour before meals, with twenty minims of dilute hydrochloric acid. Two adult females, ½ gr., t. i. d., for four days; then ⅝ gr., t. i. d., for three days; no disturbance. Two adult males, ½ gr., t. i. d., for ten days; no symptoms. Five adult males, 1 gr., t. i. d., for twelve days. Three had two or three movements of the bowels a day, but no other symptoms. One adult male, 1 gr., t. i. d., first day; 2 gr., t. i. d., second day; 3 gr., t. i. d., third day. On the morning of the fourth day there was moderate nausea, slight diarrhœa, and tender gums, when the medicine was discontinued after taking eighteen grains in three days.

To Class. 3 the medicine was given after meals in bicarbonate solution. Six adult males, ⅝ gr., t. i. d., for seven days; no symptoms.

To Class 4 the medicine was given in pills after meals, with twenty minims of dilute hydrochloric acid. Two adult males, 1 gr., t. i. d., for six days; no symptoms.

To Class 5 the medicine was given in 1-grain doses after meals, to eight patients who were taking 10 grains of iodide of potassium before meals. In every case salivation occurred before twelve doses were taken, in three after the third, in two after the fourth, in one after the seventh, in one after the tenth dose. In four cases the salivation was slight, accompanied with nausea and vomiting. In two cases, salivation severe but no other symptoms.

These experiments show that three grains daily for a week or two at least usually will not affect any part of the gastro-intestinal tract, though in one case ⅝ of a grain, three times daily, on the third day produced salivation. This patient may have been constipated, or suffering from renal disease, and from one of these conditions the mercury accumulated, or it may have been an idiosyncrasy. It is well to remember any way that a small dose can salivate. It did not seem to make any difference when it was given or whether with acid or soda. It is also evident that in large doses it must not be given with iodide of potassium. If it is converted into the biniodide in the blood, instead of alimentary canal, it might be advantageous to give ¼ gr. of the salicylate at bedtime and the iodide of potassium one hour before meals. In this way they probably would meet in the blood-current, instead of alimentary canal, and hence we would get the action of the biniodide in proper dose and still without it passing through the stomach to derange it. It would be equivalent to the subcutaneous injection of it.

IV.—PHYSIOLOGICAL AND THERAPEUTIC REACTIONS.

First-Contact Actions.

1. *Action on Albumen, Etc.*—To show the relative value of the salicylate its actions will be compared with those of the bichloride, and such actions will be presented here as are liable to occur when used in surgical therapeutics or when taken into the animal organism. I will consider the actions of the salicylate and the bichloride on albuminous substances in—

1. Neutral reaction,—that is, in the natural reaction of egg albumen, blood, muscle, etc.
2. Acid reaction,—hydrochloric acid.
3. Sodium chloride.
4. Sodium chloride and hydrochloric acid, —stomach.
5. Alkaline reaction, carbonate of sodium, —duodenum.

To determine their action on fresh raw liver, five equal thin slices were placed in five two-ounce bottles containing distilled water.

To No. 1 was added dry powder of salicylate of mercury to make $\frac{1}{2000}$. To No. 2 was added bichloride to make $\frac{1}{2000}$. To No. 3, salicylate of mercury, $\frac{1}{2000}$; sodium chloride and hydrochloric acid, U. S. P., each $\frac{1}{100}$. To No. 4, bichloride, $\frac{1}{2000}$; sodium chloride and hydrochloric acid, U. S. P., each $\frac{1}{100}$. To No. 5 was added solution of salicylate of mercury (in bicarbonate of sodium solution $\frac{1}{700}$) to make it $\frac{1}{2000}$.

In comparing Nos. 1 and 2 it was noticed that the coagulating action of the bichloride was at once marked, far more rapid than that of the salicylate. But after twenty-four hours the difference in the totality of their action did not seem to be quite so great,—that is, it was not quite so easy to distinguish the tube by the appearance, whereas at first the difference was so plain that there was no difficulty. From this it appears that the bichloride, where equal strengths are compared, has the stronger coagulating power; but the most important fact learned from the above is that it takes the salicylate longer to do its work. What the bichloride does in a few minutes takes the salicylate several hours to do. Now, if this be true, that the salicylate if given time will have considerable action (though much less than the bichloride), but that during the first few hours its action is very slight, this will help to explain why it can act after entering the circulation, and yet during its short stay in the gastro-intestinal canal produce very little irritation of the mucous membrane, because it has not had sufficient time.

Nos. 3 and 4 presented somewhat similar phenomena, except that the acid acted at once. In No. 5 there was no coagulation at all, the albuminate formed being soluble in the carbonate. Mercuric albuminate is insoluble in distilled water or acid menstruum, hence when formed in these it is precipitated. If the dry salicylate is dusted into an aqueous solution of raw egg albumen or saliva there is slight coagulation, but nothing so marked as that produced by the bichloride.

The albuminate is soluble in the halogen salts of the alkalies, also slightly soluble in the carbonates of the alkalies. If a solution of bichloride, $\frac{1}{60}$, be dropped into a sodium chloride solution of albumen, a precipitate appears, which soon redissolves. If the solution contains acid, as occurs in the stomach, the precipitate remains insoluble. Hence albuminates formed in the stomach, in the presence of large quantities of salt, without acid, would be soluble. But the albuminate formed during gastric digestion, when there is both sodium chloride and hydrochloric acid, would very likely be insoluble, and in time would pass into the duodenum. To determine whether the albuminate after entering the duodenum can act as an antiseptic, I placed some fresh liver pulp in two glasses. To one was added albuminate to make $\frac{1}{2000}$ and bicarbonate sodium $\frac{1}{100}$. To the other was added bicarbonate sodium $\frac{1}{100}$. The albuminate did not appear to retard the putrefaction in the least. I then made a number of experiments, and found that $\frac{1}{15}$ prevented putrefaction. Hence, if bichloride is an antiseptic in the intestinal canal, it seems that it is either on account of the bichloride passing as such into the duodenum, or due to its action during elimination-contact. The salicylate is converted into the albuminate much more slowly than the bichloride, and, besides, is probably not at all absorbed from the acid stomach, hence it is probable that a much larger part of it enters the duodenum as the salicylate; for this reason it would appear that it would be better adapted for intestinal antisepsis than the bichloride, which very likely produces most of its action after it has entered the blood during elimination-contact. When bichloride is poured into a solution of albumen in carbonate of sodium the yellow oxide is formed, but in a few seconds the color disappears on account of the formation of albuminate of mercury. A small part of the albuminate dissolves, but nothing like so readily as that formed in sodium chloride solution. Hence it appears that if any of the bichloride taken into the stomach should escape conversion into the albuminate or absorption from there, that on entering the alkaline duodenum it would not be permanently precipitated as the oxide, but form albuminates.

2. *Action on Putrefaction.*—To determine its power to prevent putrefaction, one ounce of an aqueous solution of fresh liver pulp was placed in each of six glasses.

No. 1 remained plain for comparison.

No. 2 added bicarbonate of sodium, $\frac{1}{700}$, to compare with the bicarbonate of sodium ($\frac{1}{700}$) solution of the salicylate.

No. 3 added salicylate, $\frac{1}{2000}$, and bicarbonate sodium, $\frac{1}{700}$.

No. 4 added dry salicylate, $\frac{1}{2000}$, to the neutral liquid.

No. 5 added dry salicylate, $\frac{1}{2000}$, and one per cent. hydrochloric acid, U. S. P.

No. 6 added bichloride of mercury, $\frac{1}{2000}$. The temperature was kept between 70° and 90°.

No. 2 was the first to become putrid, then a half-day later No. 1. At the expiration of three days there was no putrid odor from any of the others, and the one containing the bichloride had the least odor. These experiments show that salicylate of mercury prevents sepsis, whether in solution or not, and regardless of the menstruum. Though it is insoluble in acid and neutral menstrua, yet it is decomposed by organic substances, and acts as an antiseptic. It is in this way that iodoform and salol act as antiseptics.

To No. 2, which became very putrid, the salicylate, $\frac{1}{2000}$, was added, and in twelve hours the odor was much reduced, though by no means entirely gone. It appears that the powder, though only very slightly soluble in water, would be an effective antiseptic powder for surgical therapeutics. It seems that it would arrest putrefaction of the discharges in wounds and ulcers, besides acting as a mild stimulant. It might be better diluted with some inocuous powder, as boric acid. Of course, if large quantities were absorbed, mercurial poisoning might follow.

3. *Action on Artificial Digestion.*—To determine this, and compare it with the action of bichloride, the following five four-ounce mixtures were prepared, and kept at a temperature ranging from 100° to 110° F. for six hours:

Nos. 1, 2, and 3 contained pepsin, hydrochloric acid, boiled egg albumen, and water. To No. 2 was added salicylate of mercury sufficient to make it $\frac{1}{8000}$. The salicylate was in bicarbonate solution, and was precipitated on being poured into the acid mixture. To No. 3 was added bichloride to make it $\frac{1}{1000}$. At the expiration of six hours nearly all the albumen in No. 1 had been dissolved. There was only a trifle more in No. 2, and considerably more in No. 3; hence the salicylate seems to interfere very little with artificial pepsin digestion in six hours, and notably far less than the bichloride. Nos. 4 and 5 contained pancreatin, bicarbonate of sodium, boiled egg albumen, and water. To No. 5 was added salicylate of mercury, $\frac{1}{8000}$. At the expiration of six hours there was a little more undissolved albumen in No. 5 than in No. 4. Hence it appears that the salicylate in both acid and alkaline menstrua slightly interferes with artificial digestion, though nothing like to the extent that it does with putrefaction. Bichloride acts much more rapidly than the digestive ferments, and salicylate much slower, hence during the few hours sojourn of the food in the digestive tract, the bichloride seriously interferes, because it acts faster than the ferments, while the salicylate does not interfere so much, because peptonization and absorption are finished, and the excrementitious material has cleared the ileo-colic valve before the salicylate has spent its force. $\frac{1}{2000}$ prevents putrefaction nearly as completely as the bichloride, while $\frac{1}{8000}$ does not arrest digestion near as much as the bichloride. However, to be accurate, these comparisons should be made with the same strength.

4. *Action on the Living Tissues.*—1. *Skin.*—Its affinity for organic compounds is very weak, hence it is not irritating, like the mineral compounds of mercury. For this reason the ointment is very mild, and does not irritate the skin, like the citrine ointment does. It is better than the other mercurial ointments for the skin lesions of syphilis. This is specially the case where the lesions are on the face or hands. Ladies whose faces have become rough, scaly, and disfigured by irregular hyperæmic patches, find marked improvement from applying the ointment at bedtime. Dr. Inge speaks highly of it in other skin lesions.

2. *Mucous Membranes.*—It is equally mild when applied to mucous membranes. It is well spoken of in ocular therapeutics. Clinical experiments show that when in contact with the mucous membrane of the empty stomach or duodenum there is only very slight irritation in comparison with that produced by the bichloride.

Four patients who had been taking $\frac{1}{8}$ grain of bichloride, t. i. d., for about six weeks with improvement, began to complain of loss of appetite and strength, and increase of skin lesions. These I changed to the salicylate, $\frac{1}{2}$ grain, t. i. d., and return of appetite was soon noticed. It is very difficult to distinguish the first-contact from the elimination-contact action on the gastro-duodenal canal. It is not difficult to see that bichloride salivates by elimination-contact, and it is tolerably probable that much of the irritation of the intestines in mercurial poisoning is due to elimination-contact action, but in the stomach and duodenum it is not quite so plain. However, if we consider the conditions which favor irritation, and the phenomena of absorption and elimination by excretion through the gastro-intestinal tract, it will appear that elimination-contact is an important factor. Although during elimination the drug is much

diluted on account of being mixed with the whole quantity of blood, yet it must be remembered that this action is continuous, and that it passes through the neighboring vessels many times, and specially must it be remembered that its irritative power depends chiefly on chemical action, and that the chemical phenomena occurring in the glandular cells during the elaboration of its specific secretion are very active and highly conducive to decomposition of the mercurial salt, permitting the destructive action of its now nascent radicals: hence, during elimination-contact, when the gland is at the height of its function, the conditions are far more favorable for irritation than during absorption.

Absorption.

Absorption is a physical process in which the material to be absorbed must be soluble in the fluids on each side of the septum and have affinity for the material of the septum. Salicylate of mercury is insoluble in acids, hence it probably cannot be absorbed from the stomach, when it is acid during digestion. It is soluble in alkalies, and hence when the stomach is empty and alkaline, or when artificially rendered so by large doses of bicarbonate of sodium, one of the three conditions for absorption is present, and it is probable that it would then be absorbed. The fact that, unlike the bichloride, it is insoluble in acids and soluble in alkalies, makes its conditions for absorption just the opposite of bichloride. Their relation may be to a certain extent compared to that of salicylate of sodium and salicylate of phenol. It is supposed that salol produces less loss of appetite, because it can pass through the stomach undissolved and be absorbed from the duodenum; so it seems salicylate of mercury might also.

If a drop of dilute hydrochloric acid be let fall into a bicarbonate solution, a precipitate appears. This is not due to chemical change, —that is, to the formation of bichloride of mercury,—which, in the presence of the bicarbonate, is precipitated, because it readily redissolves in excess of alkali, which does not occur when bichloride is precipitated. It is probable that when a bicarbonate solution is given immediately after meals the salicylate is precipitated. Also, as shown with regard to its action on artificial pepsin digestion, a small part is likely decomposed, and slightly interferes with digestion. Then, in time, along with chyme, it will enter the duodenum, be redissolved, and again slightly interfere with digestion and be absorbed from there. If given one hour before meals, when the stomach is alkaline, and be given in bicarbonate solution containing twenty or more grains of the bicarbonate, it probably would be in large part absorbed from the stomach. Given at this time it would not interfere with digestion, but might slightly irritate the mucous membrane, as it has been shown the alkaline solution acts upon organic substances. If only a few grains of bicarbonate were given with it, the alkali might stimulate acid secretion, and hence hinder absorption. If given one hour before meals in pill form, with twenty or more minims of dilute hydrochloric acid, it is probable that a small portion would act on the mucous membrane, coagulating the mucin, etc., and that the larger part would remain undissolved, and in a short time pass into the duodenum, where it probably would not be dissolved so rapidly as it would during duodenal digestion, when there is present a large quantity of alkaline liquid. At this time it would not derange duodenal digestion, but it would likely slightly irritate the mucous membrane, and it would be absorbed more slowly than during digestion, on account of its slow solution.

To determine the relation of an acid and alkaline living mucous membrane to the absorption of the salicylate and bichloride, four dogs were narcotized, and the pylorus securely closed by double ligature, after which there were pumped through the œsophagus into the stomachs of two six ounces of water containing one per cent. hydrochloric acid, U. S. P., and into the stomachs of the other two six ounces of water containing five per cent. bicarbonate of sodium. Then, with hypodermic syringe, 2 grains of the salicylate were injected into an acid and an alkaline stomach; ¼ grain of bichloride was injected into the others. My intention was to keep the stomachs respectively acid and alkaline for twelve hours, then test the urine for mercury, collecting the urine by ligating the urethra and aspirating the bladder. As the salicylate and its albuminate are both insoluble in acid, hence it would not appear in the urine; but as the salicylate and its albuminate are both soluble in alkalies, from the alkaline stomach it would be absorbed and appear in the urine. As the bichloride is soluble in the acid and its albuminate insoluble, it is probable that a part of the bichloride would escape conversion into the albuminate, and hence appear in the urine, while the albuminate would remain unab-

sorbed; but as the bichloride is precipitated by alkalies, in the alkaline stomach, if there was much albuminous material, as in gastric catarrh, or where albumen has been introduced, the albuminate formed would be absorbed, while any oxide unconverted into albuminate would remain insoluble. But I was interrupted, and could not keep the proper reaction of the contents of the stomachs, hence I cannot at present speak positively on the conditions for their absorption. When placed in the subcutaneous cellular tissue, it appears to cause less pain than the bichloride, and is less liable to produce abscesses than the albuminate. When muriate of cocaine is added to the solution to relieve the pain, chemical change occurs, hence muriate of cocaine is incompatible with it.

Elimination-Contact Actions.

It would seem that these would be the same for all compounds of mercury, if mercury circulates in the blood as the albuminate. But if the salicylate circulates as the salicylate, and the bichloride as the bichloride, at least a part, it would appear that the degree of irritation during elimination would not be the same. It would seem that the nascent chlorine liberated in the gland-cells would be more destructive than salicyl or other organic radicals. Also, as the salicylate contains about sixty per cent., and the bichloride about seventy-five per cent. mercury, the bichloride can make only about fifteen per cent. more albuminate when each is completely converted. Hence, if they both form albuminates, the difference in the dose should be very slight, instead of the salicylate being thirty-two times as large. It might be supposed that the reason the dose of salicylate is so large is because only a part of it is converted into the albuminate, but if it is not, it is far less liable to pass through the intestinal canal unabsorbed than the less diffusible albuminate, hence it will enter the blood as salicylate, and if there converted into the same albuminate as the bichloride, there would be many times as much albuminate in the circulation as there is when $\frac{1}{32}$ grain of bichloride is given t. i. d.: hence 1 grain of the salicylate t. i. d. ought to produce grave toxic symptoms in a short time. But it does not. Then, do they both circulate as albuminates?

Experiments on persons in health and disease show that the salicylate does not salivate so easily as the bichloride, hence it suggests the possibility that they do not circulate as the same salt.

Bartholow and Ringer speak highly of mercury in acute tonsillitis and parotitis. If it is of any service in these inflammations, aside from reducing arterial tension by purgation, it is very likely by elimination-contact action. If such an action is desired, the bichloride is probably the better. This does not apply to intestinal antisepsis, for it seems likely that the salicylate there can accomplish by first-contact what the bichloride does by elimination. But when there is desired an action on the salivary glands, the tonsils, and the neighboring structures of the buccal cavity, the bichloride will probably have a more prompt and certain action, as is evidenced by its power to salivate.

In the treatment of syphilis with mercury, it is possible that considerable of the morbid material rendered soluble is excreted into the intestinal canal, and that, by remaining there an undue time, it would be reabsorbed, hence the importance of keeping the bowels moving at least daily. It is also probable that when large quantities of water are ingested the increased blood-pressure and increased solution of the products will hasten the removal from the tissues, and from the blood of the morbid materials, along with the greatly-increased excretion of water. The mercury excreted with the urine retards its putrefaction. The urine of three patients, each of whom were taking three grains daily, was not putrid after four days at a temperature of about 70° F.

Circulation-Contact Actions.

The action of salicylate on healthy, inflammatory, and syphilitic structures is probably about the same as that of the other salts, except that it is much less active, for the reason that it does not readily form new compounds with organic compounds. For this reason, when the stomach is vigorous, and is not deranged too much by the bichloride, it is very likely the best and most effective preparation to exhibit. But when the stomach is weak to begin with, or when bichloride or iodide of mercury has so deranged it that there is loss of appetite and the patient is getting worse, then these salts must be suspended. It is in such cases as this that the salicylate, though much less active, may render valuable service. When the patient cannot eat, it is useless to continue the bichloride, for it will not only make the appetite still worse, but the nutrition will be so deranged, the vitality of the cells will be so reduced, that after the mercury reaches the morbid process, the cells will not have sufficient power of metabolism

and elimination to be benefited by it. In such cases the salicylate is more convenient, and usually more agreeable to the patient than is resort to hypodermic injection.

In conclusion it may be said that—

1. Because the salicylate is likely not absorbed from an acid membrane, it will usually produce less derangement of the stomach than the bichloride.

2. Because the mercury is combined with an organic radical, it will produce less irritation during both first- and elimination-contact actions than the bichloride.

3. Because the salicylate contains less mercury and acts slower than the bichloride, it has less action on albumen and on bacteria of putrefaction and far less on digestion.

4. Because the salicylate passes through the stomach to the duodenum and there is dissolved, it appears that exhibited with hydrochloric acid it would be better adapted for an intestinal antiseptic than the bichloride, which probably is dependent mainly on its elimination-contact action in the intestinal canal.

5. Because the mercury is combined with an organic radical, it should not be prescribed with mineral salts of the heavy metals.

6. Because iodide of potassium given with it converts it into the biniodide, the salicylate should not be exhibited at the same time, unless it be in small doses.

7. Because the salicylate is insoluble in acids it should not be prescribed with drugs requiring an acid menstruum for solution.

8. Because chemical change occurs when combined with muriate of cocaine, they should not be given together.

9. Because the bichloride is probably more active and effective in syphilis, it probably is the best when it agrees.

10. Because the bichloride has such marked elimination-contact action, it is the better when such action is desired, as in acute tonsillitis, parotitis, etc.

168 South Halsted Street.

BRAIN WOUNDS, WITH EXCESSIVE LOSS OF STRUCTURE.

By G. Archie Stockwell, M.D., F.Z.S.,
Port Huron, Michigan.

REFERRING to injuries of the head, the venerable Hennen remarks: "The young surgeon who for the first time witnesses wounds of this description will at every step have something to *un*learn. He will find symptoms complicated, contradictory, and insufficient to give any rational clew to their causes; diagnostics, of the truth of which he had read himself into conviction, totally unsupported by the results of practice; and the symptoms he was led to look for as infallible accompaniments of certain states of disease, so often wanting altogether, that he will be inclined to relinquish the hope of ever arriving at a correct theory. At least he will enter the clinical ward with the pride of science considerably reduced." Certainly no one can come in contact with cases of brain wounds, or read Mr. Hennen's admirable reports, without realizing the accuracy of his observations.

Critical examination of the human cranium reveals it a citadel,—so to speak,—carefully walled about, and fortified for the protection of its contents,—the organ of intelligence and will. The very points that, to the superficial observer, appear most vulnerable, on closer and more careful inspection, prove to be built up and buttressed—here with an arch, there a ridge, and again a prominence or angle—in most extraordinary manner, securing to the part a maximum of strength, with a minimum expenditure of material. Atop of this, the whole is covered with a movable *glacis*, as it were, the scalp, which is calculated to deflect assault, and turn the direct into an *in*direct blow. It is to these factors that the head is indebted for its great immunity from serious traumatisms as compared with other portions of the body.

Because it is held the seat of voluntary impulse, and the prompter of the various functions that collectively go to sustain the mysterious phenomena of Life, until within a decade (with few rare and notable exceptions) the brain received little attention from surgical pathologists and physiologists, and this little of most trifling and desultory nature. The theory of non-interference in extensive traumatic lesions of the cerebrum was carefully inculcated and persistently insisted upon; and even to-day the vast majority of medical men are found clinging to this most absurd *fetich*, for such it really is. It was (and yet is) generally believed, and taught, that the nervous system, including the contents of the cranial vault, is composed of structures so frail, minute, complex, and uncertain, as to be beyond the delicacy of the human hand or comprehension of the human intellect; and consequently unsafe, if not criminal, to med-

dle with, even in attempts to restore and further its functions. In other words, while it was deemed permissible to employ the trephine for the purpose of elevating depressed portions of bone, such constituted the fastigium of cerebral surgery, and was tabooed for all other purposes. And this, too, in the face of the fact that Celsus and others, more than a century before the Christian era, defined the symptoms of clot, abscess, compression, etc., and taught active and operative measures for their relief; that to-day mummies are found in Egypt with crania bearing marks of the trephine, manifestly applied with other views than the relief of fracture, while *bas-relievos* and mural sculptures depict the instrument in actual use. It was with the decline of *Mystical** knowledge that the arts and sciences, medicine included, degenerated and fell into decay; and the esotericisms inculcated, owing to prevailing ignorance and superstition, led the "Fathers" of the Church to locate the essence of Life within the cranial vault, thus in turn giving rise to the dogma that the brain is the seat of a special factor denominated the "Soul," to meddle with which, must needs be an unpardonable insult to Deity!

The difficulty the human race experiences, even in the higher walks of life and education, when attempts are made to override and rise superior to the superstitions of centuries, is well exemplified by the indifference with which occasional recoveries from severe cranial wounds with excessive loss of cerebral substance, has been regarded in the past. Such, instead of being deemed natural sequels of reparative processes and phenomena of life, worthy of study and fit to be fostered, were merely "wonderful," or "special dispensation" vouchsafed by a "beneficent Providence to its own glory and ends." No other conclusions appear to have been drawn: the lesson inculcated by Nature was studiously ignored, and all bowed to the miraculous, forgetting that most trite of Hellenic aphorisms, *Thaumata moris*,—"miracles for fools." And, at last, when a few bolder spirits ventured to suggest the nervous system might be equally tolerant with other tissues and organisms of the body, and equally amenable to reparative processes, they were assaulted on all sides, even from the pulpit, which threatened with the damnation of heresy. Happily, the age of reason and common sense is once more in the ascendant; propositions are no longer accepted without scrutiny and analysis; and it is safe to predict that the day is close at hand when the brain will be as freely amenable to surgical procedures as the abdomen, and that, too, with much smaller percentage of mortality.

Before the brain can become the seat of traumatic injury, its protecting walls must be penetrated. Hence we find three special phases of fracture,—viz., of the base; of the vault; or of both.

By the great majority of teachers and authors, fracture of the base of the skull is held necessarily and invariably *fatal*. This is the testimony of Erichsen, Wood, Cooper, Neudorfen, and a host of lesser lights, and is the more remarkable, in that it has been practically and repeatedly disproven, there being few well-appointed anatomical museums that cannot boast one or more crania with repaired basal fracture, occurring months or years prior to death, and that, too (where their history could be traced), with so little disturbance of vital functions as to escape recognition. Dr. Charles Nancrede* mentions two such specimens in the United States. Further than this the subject of basal fracture invites no special attention in this connection.

Fracture may involve the outer or the inner table, or both.

The relations to the brain of the former, as a special lesion, is secondary merely; but the latter two invite careful attention, and for all practical purposes may be considered as identical, and together.

Fractures of the inner table, or both tables, are attended almost invariably by extravasation of blood within the cranial vault, which may appear in various situations,—viz., between the *dura mater* and the skull; in the cavity of the *arachnoid;* within the *pia mater;* within the substance of the brain itself; and in the ventricles. Their relative frequence appears to be in the following order: 1, between the *dura* and osseous vault; 2, in the *pia mater*, and in the cerebral substance or the ventricles.

Extravasations into the cavity of the arachnoid, necessarily have their source in the vessels of the *pia mater*, in the superficial veins, or in the great sinuses; and rise, apparently, with equal facility from slight or severe wounds.

* See "Curiosities of Therapeutics" in THERAPEUTIC GAZETTE for August, October, and November, 1887.

* Ashurst, "International Cyclopædia of Surgery," vol. v. p. 37.

Those between the dura and the skull originate from small blood-vessels passing from the membrane to the vault, from the middle *meningeal*, and from the venous sinuses; and they may develop suddenly or gradually, or in greater or less amount, according to circumstances and surroundings.

Hemorrhages into the *pia*, into the ventricles, and within the brain substance, are invariably the result of infraction of cerebral continuity.

Coagula within the *arachnoid* and *pia mater*, are especially prone to cover considerable superficial areas, and those between the *dura* and osseous vault, to speedily take on decomposition, whereby are developed grave cerebral and meningeal complications that frequently result fatally. Thrombus and pyæmia are by no means uncommon sequels to such instances.

The prognosis of effusion or hemorrhage of the first-named class—within the *arachnoid* and *pia*—is always grave, since if death does not speedily follow, the attending symptoms, —such as migraine, epilepsy, insanity, paralysis, etc.,—render life a burden to sufferer and friends alike; and though it is sometimes claimed that absorption may, and does, take place within the *arachnoid*, no definite case has ever been cited, and the physiological relations are obviously inimical to such process. Extravasations beneath the skull and within the *arachnoid*, however, have repeatedly been made amenable to surgical procedures, and that, too, with little difficulty or danger: hence this portion of the subject may be dismissed, remarking only that the reasons for ignoring hemorrhage and coagula within the brain and ventricles, are as invalid as those that demand non-interference with like accumulations upon the surface of the cerebrum or within the *arachnoid*.

As a sequel to traumatism with fracture and extravasation, conditions may obtain within the cerebral substance as follows: 1. *Concussion;* 2. *Contusion;* 3. *Compression;* 4. *Pachymeningitis;* 5. *Leptomeningitis;* 6. *Intra-dural suppuration;* 7. *Encephalitis;* 8. *Abscess;* 9. *Pyæmia;* and 10. *Hernia cerebri.*

Concussion, unaccompanied by hemorrhage, is the natural sequence of injury or infraction of cerebral substance or the meninges.

Contusion expresses a condition resultant upon rupture of blood-vessels, or laceration of the more minute and microscopical brain elements.

Compression follows effusion of sanguineous material, depressed portion or portions of the comminuted or punctured vault, entrance of foreign substances, and hyperæmia, or exudation.

Pachymeningitis designates chronic and local inflammation of the *dura*, resulting, secondarily in thickening and new cell formation, that, if not interfered with, is ultimately followed by necrosis of the osseous vault.

Leptomeningitis describes a subacute inflammation of the *arachnoid* and *pia mater* arising from irritation.

Intra-dural suppuration most commonly occurs as the sequel of putrescent coagula, necrosed bone, or other irritating and foreign agencies.

Traumatic *encephalitis* may follow concussion or laceration, either with or without bone spiculæ and deposit of extraneous matter.

Abscess, *pyæmia*, and *hernia cerebri* are secondary factors, and of connective and subjective importance only.

The direct complications of cranial fracture, however, are *encephalitis* from injury to cerebral substance, and *intercranial hemorrhages.*

From exhaustive and carefully compiled statistics, prepared by Dr. Wharton, it is a simple matter to formulate the percentage of fatality accruing to the different (regional) classes of perforating injuries of the cranium, viz.:

Orbital, $\frac{17}{18}$, or 94 per cent.
Sphenoidal, $\frac{4}{5}$, or 80 per cent.
Occipital, $\frac{2}{3}$, or $66\frac{2}{3}$ per cent.
Parietal, $\frac{1}{2}$, or 50 per cent.
Frontal, $\frac{3}{7}$, or 43 per cent.
Temporal, $\frac{2}{5}$, or 40 per cent.

Certainly, this showing is the reverse of satisfactory, and not at all creditable to surgical science in this nineteenth century, since it proves that, under present popular methods of therapeutics, the death-rate from cranial injuries, taken as a whole, is approximately *sixty-six and two-thirds* per cent.

On examining these and other available statistics more critically, it will be discovered the subdiploëtic or dural surface of the cranial vault, invariably suffers most, in consonance with the well-known philosophical axiom, "Injury follows the line of *extension* rather than that of *compression.*"

When collapse ending in dissolution does not speedily succeed fracture, the feasibility of surgical interference, and of operation for the relief of compression, must be considered; and from experience through experiments conducted upon lower animals in connection with

intra-dural inoculations, and the artificial and voluntary production of congestion and suppuration, it is evident, in the great majority of instances, that resort to the knife, following the trephine, is not only justifiable, but imperatively demanded, *even to penetrating the cortical substance of the brain, and evacuation of its ventricles.* This is rendered more easy and simple by reason of cerebral localization, for it has recently been demonstrated beyond cavil and dispute, that the cerebral cortex is functionally differentiated into a number of centres, each more or less independent of the others. When we have brain lesion, by observation of the function or functions affected, it is possible to locate with a definite degree of certainty the seat of injury. There yet remains, however, some differences of opinion as to the exact seat of the various motor and sensory areas, the latest views being those of Feirrer, which are herewith subjoined as given by A. Pierce Gould :*

"The cortex of the anterior two-thirds of the frontal lobe of the brain, that corresponds to the frontal bone, is *not* the centre for any voluntary motion or of perceptive sensation, but is probably concerned with the higher mental function only." †

"The region of the brain bounded by the fissure of Rolando, including the posterior extremities of the three horizontal frontal convolutions, the whole of the descending frontal and ascending parietal, and the parietal lobule, together with the inner surface of the marginal convolution, is the motor area which is further divided up into special centres."‡

"The temporo-sphenoidal lobe, with the supra-marginal and angular gyri, are the seats of perception of the spinal centres.

The part of the motor area adjacent to the great longitudinal fissure, is the centre for the movements of the legs ; and the lower part of this area is the centre for the arms ; and the part in front of the lower extremity of the fissure of Rolando (that part of the area in front of the ear) is the centre for the face.

The mesial surface of the marginal convolutions, is the centre for the trunk muscles, the anterior part representing the neck, the middle part the shoulders, and the hinder part the centre for the lower muscles of the trunk.

The superior temporo-sphenoidal convolution has been shown to be the centre for hearing." *

With regard to lesions of cranial nerves, it may be well to recall a few facts in this connection :

1. Loss of smell is evidence of injury to the *olfactory* nerve, though not necessarily at its source, and care should be taken to discover if the nasal fossæ is clear and not obstructed by blood clots, displaced bone, or cartilage.

2. Injury to the sources of the *third* pair may affect only a portion of the course of the nerve or nerves, procuring but partial and limited paralysis.

3. Paralysis of the superior oblique muscle, causing diplopia below the horizontal meridian, and internal strabismus, with the eyeball directed downward, if not due to disease of the muscle tendon, is almost sure to be derived from the centre of the *fourth* nerve.

4. While the *fifth* nerve is rarely alone involved, when affected,—especially if partial, and the lesion circumscribed,—usually results in sloughing of the cornea.

5. Internal strabismus without muscular paralysis (the external *rectus* excepted) commonly refers to involvement of the primitive area of the *sixth* nerve.

6. The source of the *seventh* is most frequently involved in lesions of the brain, especially where laceration is present as a sequel to fracture ; and the evidences of facial paralysis that supervene are unmistakable.

7. The *eighth* and *ninth* nerves are rarely affected by traumatism ; but dysphagia, dyspnœa, with slow respiration and altered rhythm of the heart's action, palsied tongue, and anæsthesia of pharynx and base of tongue, are evidences of such lesion.

If evidences of compression are continuous and urgent, as manifested by unconsciousness, stertorous breathing, dilated pupils, and motor paralysis, they may justly be attributed to *depressed bone*, or the introduction of some foreign substance from without ; but if appearing only after a lapse of some hours, they are undoubtedly sequels to *hemorrhage* ; if delayed for some days, *pus* is probably the disturbing factor. In either case, however, compression will be uniform owing to the adaptability of the cerebro-spinal fluid, and obedience to the law of dispersion of fluids, which everywhere maintain their equilibrium. Again, when the blood-vessels are largely deprived of their contents,

* Surgical Diagnosis, p. 84.

† This is doubtful. Observe case 3, in paper to succeed this.

‡ Surgical Applied Anatomy, p. 30.

* A. Pierce Gould, "Surgical Diagnosis," p. 90.

anæmia obtains with unconsciousness, and coma, and labored respiration; and when the *corpora quadrigemina* and *third pair* are involved, dilatation of the iris and paralysis are present.

In the great majority of cases, compression arises from extravasated blood or formation of purulent fluid, the latter frequently a sequel of the former; and, so far as can be determined from available statistics, at least six-tenths of the cases are due to the second-named cause.

Pursuing statistical evidence still further, it is found that pus accumulates between the dura mater and skull in *five* per cent. of the cases only; that in *twenty-five* per cent. compression is the sequel of suppurative meningitis; and in *seventy* per cent. develops as an abscess within the substance of the cerebrum itself.

Symptoms of purulent accumulation within and about the meninges occur, commonly, between the *sixth* and *twenty-fourth* days; but evidences of cerebral abscess are manifested only between the *fourteenth* and *twenty-fifth* days.*

When collections of pus manifest themselves within the *arachnoid*, in spite of contrary supposition, there is no authentic case (as already noted) where such accumulations have ever been absorbed; and further, it is a well-known fact that spontaneous evacuation of cerebral abscess is the greatest of surgical rarities. However, in a few isolated instances it must be admitted that pus, when collected near the surface, has succeeded in penetrating the obstructing barriers and securing outlet external to the skull; but even these few cases, with one or two notable exceptions, ultimately resulted disastrously. When the abscess is of the middle lobe, it is not impossible that it may penetrate and evacuate itself by way of the ear or mastoid cells; but such inculcate no lesson or example worthy of dependence, save that the brain is more tolerant than is generally supposed and taught, and that too early resort to trephine and knife is impossible where life is to be preserved.

The statistics of conservatism reveal a death-rate of no less than *seventy-four* per cent., which, by operative interference, has been reduced to *fifty-seven* per cent.;† and that, too, with the disadvantage, that in nearly every instance, surgical measures were delayed to (and even beyond) the last moment compatible with the smallest degree of safety. With this discrepancy of *seventeen* per cent. in favor of the knife and trephine, strange to say, we find the majority of surgeons, many of highest standing and rank, arrayed on the side of conservatism, expectancy, and the "possibilities of nature." *Per contra*, however, I am glad to record that Gross, Liddel, Roberts, and a few kindred and progressive spirits have entered the lists as supporters of Neudorfen.

Careful consideration of the facts in evidence reveal that surgery is constantly invoked for the relief and evacuation of purulent matters in the regions of the economy where the ratio of mortality has ever been in excess of that of brain maladies; therefore it behooves every practitioner, to inquire what anatomical or physiological peculiarities pertain to the nervous system, that it alone should be exempt from the skill of the surgeon. The day has long since fled when it was believed the ventricles were the "*apartments*" and the sinuses the "*emunctories* of the soul;" and,—in scientific circles at least,—the *fetich* no longer obtains that the brain is the seat of *all* organic life, and each of its fragmentary portions the definite derivation of a *vital* function. Note the history of cranial injuries, and the strenuous efforts put forth by Nature in attempts to relieve and repair,—efforts sometimes successful despite superstitions that forbade logical interference. Recall the experiments of Dalton and other physiologists, that conclusively demonstrate the brain is but one of many component parts that go to make up the economy, and the removal of entire lobes under certain conditions is not necessarily dangerous to life; that almost the whole of either the cerebrum, cerebellum, or medulla oblongata, may be sacrificed without fatality, and perhaps restored by processes of Nature.* With such evidence at the command of practitioner and student for the last quarter of a century, does it not appear as if medical science, so far as the cranial cavity and its contents are concerned, has been wilfully blind and stupid, not to say criminally negligent?

Searching the literature of the past, I find in numerous books and journals several examples among all classes of vertebrates, and a goodly number among mankind, wherein the cranial vault has been fractured and fissured in all conceivable localities, its walls broken down and comminuted, and large

* *Vide* Nancrede in "International Cyclopædia of Surgery" (Ashurst).

† *Vide* Neudorfen.

* See "Human Physiology," by J. C. Dalton.

portions removed—arteries torn and meninges ruptured—sinuses opened and ventricles entered—and even entire lobes of the brain destroyed,—yet recovery supervened, and the victims were enabled to resume their ordinary pursuits in life, apparently little or none the worse for the experience, save suffering due to wounds and shock.

Careful study of perforating injuries of the cranium involving the contents, whether the result of accident or experiment, reveals the *almost* axiom that, *The more severe and extended the injury* (within certain limits) *the greater the assurance of successful recovery!* That when the cranial walls are crushed and comminuted, and the brain subjected to extensive laceration,—when the force producing the injury has been sharp, abrupt, and incisive,—the prognosis in the main is favorable.

Why this is so, requires little explanation. It is because, in such instances, the cranium is not given an opportunity to distribute and equalize the force of the blow, and thus transmit through its substance—because the vibrations thereof are not permitted to involve parts of the brain remote from the seat of injury. It is this last that secures fatality to concussion and contusion, which are the most fatal of all the factors entering into cranial and intra-dural traumatism. Sharp instruments, quickly and forcibly applied, procure less degrees of concussion and comminution than dull and blunt weapons; while the latter, with deliberate, ponderous, and crushing blows, procure concussion and contusion by reason of slow momentum that sends the vibrations arising therefrom to remote portions of skull and brain. This is why sand-bags and bludgeons are invariably more fatal than edged weapons, and the stone more dangerous than the bullet.

The greater the extent of the perforating injury, then (within limits) the greater the chance of recovery, since opportunity is afforded for the free exit of lacerated, mangled, and inflammatory products, whereby is lessened the dangers of compression. A fragment or mere spicula of bone, has brought more than one unfortunate to the grave, and less than a drachm of pus has proven equally fatal; and it is in this avoidance of compression that is found the secret of the wonderful recuperative powers sometimes, nay, *frequently*, exhibited when the brain has been desperately (and apparently) hopelessly wounded. Corroborative of this last assertion I cite the following:

1. September 13th, 1848, Dr. Harlow, of Cavendish, Vermont, was called to see one Phineas P. Gage, who, while engaged in blasting upon a line of railway, had a tamping-iron—a species of crow-bar—driven completely through his head. This piece of iron or steel, thirteen and a fourth pounds weight, thirty-seven inches in length, and an average of one and a fourth inches diameter, entered by its pointed end just beneath the left zygoma, escaping through an opening at the vertex three and one-half inches in diameter, at the junction of the sagittal and coronal sutures. The parietal (both) and frontal bones suffered fracture, as did also the floor of the left orbit, and the left temporal portion of the sphenoid. Besides, the lateral sinus was opened, the optic nerve severed, and the eye forced out upon the cheek, and the left anterior lobe of the cerebrum traversed and almost wholly destroyed, considerable quantities of lacerated brain escaping on several occasions in connection with inflammatory products.*

In spite of the prognosis given, "*Inevitably fatal,*" a speedy and most excellent recovery was followed with no impairment of mental functions, nor evidence of injury other than scars left by wounds, and loss of vision in the left eye; and it is stated by Professor Bigelow, of Harvard Medical College, who was associated with Dr. Harlow in the case, that Gage was wont to vigorously and vociferously curse his physicians, because they did not perform the impossible feat of restoring sight to the injured optic. Twelve years later this man was seen and recognized on the streets of Valparaiso, Chili, where he followed the occupation of omnibus driver, by Dr. Henry Trevitt, of Cincinnati. Subsequently he removed to California, where he died in 1868 or 1869, when his skull came into possession of the Harvard medical museum, where it may now be seen. Strange to say, after a lapse of nearly or quite forty years, the lessons inculcated by this case have been almost universally unheeded, and the circumstance, oft quoted, regarded merely as a surgical rarity and curiosity.

* Further particulars of this case may be had from files of the *Boston Medical and Surgical Journal*,—viz., vol. xxxix. p. 389; vol. lxiii. p. 327; and vol. lxxx. p. 116. An account also appears in the *Am. Jour. of Med. Sciences* for July, 1850; and Bryant, Gross, and other surgical authors give it brief mention in their works.

(To be continued.)

CHANGE IN THE COLOR OF THE HAIR, FROM THE WHITE HAIR OF OLD AGE TO BLACK, PRODUCED BY JABORANDI.

By D. W. Prentiss, A.M., M.D., Washington, D. C.*

THE following case is reported, as adding another to the evidence that jaborandi will produce the effect mentioned under favorable circumstances :

Mrs. L., aged 72 years, suffering from Bright's disease, contracted kidney. Hair and eyebrows have been snow-white for twenty years. Suffered greatly from itching of the skin, due to the uræmia of the kidney-disease. Skin harsh and dry.

For this symptom fld. ext. of jaborandi was prescribed, with the effect of relieving the itching. It was taken in doses of 20 or 30 drops, several times a day, from October, 1886, to February, 1888.

During the fall of 1887 it was noticed by the nurse that the eyebrows were growing darker, and that the hair of the head was darker in patches. These patches and the eyebrows continued to become darker, until at the time of her death they were quite black, the black tufts on the head presenting a very curious appearance among the silver-white hair surrounding them.

In the *Phila. Med. Times* of July 2, 1881, I published a case entitled "Remarkable Change in the Color of the Hair from Light Blonde to Black in a Patient while under Treatment by Pilocarpine. Report of a Case of Pyelo-Nephritis, with unusually prolonged Anuria." This was a case of a lady, 25 years of age, and the drug was used to relieve the uræmic symptoms resulting from the anuria, which latter was extreme.

A record was kept of the amount of urine excreted, and this shows that on one occasion, from December 16 to December 23, a period of seven days, not a drop of urine was passed, and that from January 22, 1881, to February 2, eleven days, there was total anuria.

From January 22 to February 11 (twenty-one days), but thirty-six grammes, or a little over two ounces of urine, were passed. During this time the catheter was used twice daily. The uræmic symptoms were very marked and distressing, consisting of dry skin, continual vomiting, severe headache, insomnia, muscular twitchings, confusion of vision, delirium, and threatened convulsions. Hot baths and hot packs did not cause sweating, and gave no relief.

On December 16, 1880, treatment of pilocarpine hydrochlorate hypodermically was commenced, the dose given being 1 centigramme (gr. $\frac{1}{6}$). The effect of this was very prompt, and the sweating and salivation produced most profuse. The relief to the uræmic symptoms was complete, the patient falling into a quiet sleep as soon as the effect of the drug ceased, and sleeping all night, awaking in the morning bright and refreshed. The pilocarpine was thus used twenty-two times from December 16, 1880, to February 22, 1881, requiring thirty-five or forty centigrammes.

As the patient became accustomed to the medicine it was found necessary to give 2 centigrammes at a dose.

After February 22 she began to improve, and no more was required.

Change in Color of the Hair.—All her life up to November, 1880, the hair was a light blonde. Four specimens of the hair were sent to the editor of the *Phila. Med. Times*, with the report of the case, for his inspection, and were as follows :

"1. *November*, 1879.

"2. *November*, 1880.—Both the same color, —a light blonde, with tinge of yellow.

"3. *January* 12, 1881.—A chestnut brown ; and—

"4. *May* 1, 1881.—Almost a pure black."

The growth of hair was also more vigorous, and individual hairs thicker.

I believed at the time, and still believe, that this change of color was caused by the pilocarpine. The lady is still at this date (March 10, 1889) under my observation. Her hair is now dark brown, having returned to that color from black. The full report of this case can be found in the *Phila. Med. Times* for July 2, 1881.

At the time the case was reported, the facts as stated were received with considerable incredulity, the editor of one well-known western medical journal openly refusing them credit. Others preferred the charge that the lady had formerly bleached her hair, and that when this was no longer possible her hair returned to its original color.

In reply to these "suggestions," I will only say that all the facts are known to scores of people at her home in Washington, D. C., and are entirely beyond question.

As illustrating the ubiquity of the daily press, and the ease with which all sorts of nostrums, valueless or otherwise, may be

* Professor of Materia Medica and Therapeutics, Columbian University, Medical Department.

brought into notice through the newspapers, and how easy it is to make such a matter profitable to the advertiser, I mention an incident in connection with the case just reported.

It seems that some enterprising newspaper man became cognizant of the case, and put a short notice in a New York daily paper, to the effect that a drug had been discovered that would turn white hair black, and make hair grow on bald heads, giving my name as being connected with the Smithsonian Institution.

This paragraph must have been extensively copied in newspapers both throughout this country and abroad. The first intimation I had of its existence was an avalanche of letters from all parts of the country wanting information, some offering money for the receipt, others enclosing money in advance, which latter, be it known, I at once returned.

One from London, England, enclosing the half of a two-dollar bill, with the information that the other half would be speedily forthcoming on receipt of the formula or medicine.

One from a hair-dresser, Geneva, Switzerland, offering to go in partnership and divide profits.

The majority of the inquiries were from gray heads, the remainder from victims of alopecia.

Another interesting example of newspaper enterprise was the publication about the time referred to, in a New York Sunday paper, of the case of the wife of a sea captain in France, representing that it was taken from a French journal of science.

The captain commanded a steamer plying between Marseilles and Alexandria. He had recently married a young wife,—a blonde.

The wife became sick with kidney-trouble, and during her husband's absence was sent to her home in the Province of Toulon, where she was treated by the use of pilocarpine, and recovered.

Subsequently she went to meet the husband upon his return from Alexandria. On the quay, when the captain came ashore, a dark-haired woman, with black eyebrows and a pronounced moustache, threw her arms around him, and claimed him for her husband.

He repelled her. Oh, no, his wife had beautiful blonde hair. He would have nothing to do with her.

She followed him to their home, but was denied admission. Finally, as a last resort, she brought suit in the court for recognition of her rights.

Then followed a detailed account of the lawsuit, names of court, judge, etc., being given.

The captain was finally convinced that she was his lawful wife, having been transformed by that nefarious drug pilocarpine.

Alas! for the correctness of this romance. I searched the files of the French journal in vain. The proceedings of the court in question knew nothing of the virtuous captain and his sad spouse.

I wrote to the editor of the New York Sunday paper for the name of the writer of the article, and received for reply that it was Dr. D., but he had gone to Chicago, and it was not known when he would return. To this date I have not found Dr. D.

ATROPINE AS A REMEDY FOR SHOCK.

By Frank C. Bressler, M.D., Baltimore, Md.

WHILE reading the numerous articles found in the Therapeutic Gazette for December, 1888, I was much pleased to see an abstract of a paper on "Shock," by Dr. Cheever.

I think the paper an admirable one, and one which brings forth hints only too often neglected by the medical man. The article bears reading and its prescripts remembering.

I, however, was much impressed by some of the suggestions found in the editorial comments which followed the article.

One of the first things in shock to be looked after is the amount of injury the patient has sustained, then the form of shock we have to contend with. For we know that one individual who may barely have had a scratch will have shock so profound that his life may be despaired of. Another may undergo a very trying operation, and show comparatively little shock as compared to the amount of injury done. This, then, brings us to the point,—namely, where is the seat of shock primarily seated?

We suppose it depends upon some molecular change in the nervous system, confined to the various centres situated in the medulla oblongata primarily; then involving the nervous system as a whole later on, and in proportion to amount of the degree of involvement depends the intensity of the shock. Hence we have mental and physical shock. The first form requires different treatment from the second,

as the first is not so very depressing to the centres. Again, not so lasting. Therefore kind words, cheerful friends, camphor, and nervines form the proper line of treatment. While the second requires stimulants which are more lasting in effects. In the editorial comment a good hint is thrown out,—namely, "to have a clear idea of the physiology of the process." It is stated that the central phenomena of all is "failure of circulation,"—*i.e.*, vaso-motor paralysis. This is true as far as it goes. It, however, refers to the vaso-motor nerves only, and in so doing it ignores one point in particular, and that is the central origin of shock.

I believe, from what little experience I have had in the treatment of shock, that its seat is in the medulla oblongata, and is dependent upon some molecular change, since shock involves the cardiac, respiratory, vaso-motor, secretory centres, etc., in every case, and in proportion to the depression of these centres do we have the intensity of shock. That such is the case I think stands to reason. If we carefully investigate the physiological action of the remedies applicable to the treatment of shock, atropine would stand first, and ought to be the remedy *par excellence*.

It behooves us, then, in the treatment of shock, to watch these centres and apply our remedies accordingly, and in this connection I would like to refer to a case which I treated with happy results by atropine. This supports the editorial opinion advanced as regards the value of atropine in shock.

Mrs. P., æt. 56, American, of a nervous disposition, was taken one morning at five o'clock with dyspnœa. I was called, and, after examining her chest, found nothing in particular the matter. Knowing her to be hysterical, I gave her some fld. ext. valerian., ʒi, every two hours, in water. About two hours later I was again called, and told to come immediately, as she was dying. Upon my arrival I was dumfounded at the change that had taken place in her. Skin icy, and covered by a clammy sweat. Hands, forehead, nose, lips, and feet pale and cold as ice. Mouth wide open and gasping for breath, so that we opened all doors and windows. Some little cough; respiration slowed and shallow; pulse soft, but fair in proportion of intensity of case; pupils moderately dilated; countenance anxious, and face pinched; in short, all the symptoms of a well-marked case of apparent internal hemorrhage were present with resultant collapse. I immediately had her wrapped in a woollen blanket, hot bottles applied to her extremities, feet and hands rubbed moderately severely until the friction had warmed them. Brandy was injected by hypodermic syringe, also by mouth. No improvement was noticed. I sent to several drug-stores, and ordered ammon. carbonate, gr. v, spt. etheris comp., ♏xv, to be injected by hypodermic syringe, likewise gave it internally. Still no change. Breathing was becoming shallower. I now stopped these, and, thinking her case to result fatally, sent for all the members of her family and likewise for her spiritual adviser. All this occurred in about twenty-five minutes. Having some $\frac{1}{60}$ of gr. atropine sulph. tablets in my hypodermic case, I thought, now we will see whether atropine is the true respiratory stimulant, also whether it will stimulate the other centres in the immediate vicinity. I injected $\frac{1}{60}$ of a grain into her, waited about five minutes, and finding no change, I injected another $\frac{1}{60}$ of gr. About three minutes later her breathing began to get freer, pulse became fuller, and her condition much improved; in fact, atropine had acted like a charm. She now began to improve constantly, and by noon was pronounced out of danger. I am certain had I not given her atropine she would not have recovered, since no one can imagine how desperate her case was except those present. She improved rapidly, and was discharged from service on the third day.

This, then, seems to support my view that shock depends on the above-mentioned condition, and knowing the physiological action of atropine, also its *modus operandi* in this case, would lend support to the above opinion. From this we may draw the deduction that to treat shock we must apply such remedies as will act on these centres.

In this connection I might say that strychnine might prove useful if failure of respiration is predominating.

The suggestion that injections of digitalis might prove of avail is a good one. I have used it with good effect, but the objections to its general use is the difficulty of getting a standard preparation. Since some druggists make it themselves, others buy from different makers, hence different effects. Digitaline might be substituted for it, and is handy, since it may be obtained in tablet form.

Sometimes combinations of digitalis, atropine, nitro-glycerin, strophanthus, etc., act very well.

In conclusion to what has been said upon the treatment of shock, I would like to add a little more based upon experience. When-

ever an operation is to be undertaken, precede it by an injection of a small dose of morphine and atropine, since in small doses they are stimulants. Give that anæsthetic you have been accustomed to give. If shock is great, ether is preferred. If you use chloroform, nitrite of amyl added to it will tend to diminish its depressing effects. In other forms, independently of operations, injections of carbonate of ammonia combined with spt. etheris comp. Hot water, with a little milk, internally as often as deemed necessary, as it is handy and always to be obtained. Rectal injections of small quantities of hot water will also prove valuable. To these your atropine, digitalis, etc., as case indicates it.

In writing these few lines I claim nothing original. All that has been said was long ago known. I, however, wish simply to lend support as to the value of atropine in the case above reported, and likewise wish to draw attention to one point chiefly, and that is, be on your guard by watching the centres and support the failing ones.

1713 BANK STREET.

TWO CASES OF OPIUM-POISONING IN YOUNG CHILDREN: RECOVERY.

BY C. L. DODGE, M.D., KINGSTON, N. Y.

IN January, 1885, I was called to see an infant, 6 weeks old, who had been poisoned with valerianate of morphine. The mother told me, on my arrival, that the child had been very fretful for several days and seemed to have pain. She had given it gin, fennel-tea, etc., but it seemed to grow worse instead of better. She then remembered that she had one or two "powders" left that her family physician had given her for severe after-pains, and these, having given her so much relief, she thought she would give part of one to the baby. Not knowing the nature of the medicine, she assumed that half of one of the powders would be about right for the child. She accordingly administered this quantity to the infant about one o'clock. In a little over half an hour the child was thrown into spasms, and she sent for her regular family physician. He was out of town and the messenger returned without him. Not knowing the dangerous character of the medicine she had given, the mother waited till late in the afternoon for the return of her regular medical attendant. Upon his arrival the messenger informed him what the mother had given the baby, and he, being unable on account of a facial neuralgia to attend the case, requested me to do so. He told me that the powders he had given the mother for after-pains were valerianate of morphine, $\frac{1}{4}$ grain each. She had therefore given the child $\frac{1}{12}$ grain of valerianate of morphine. I arrived at the house about half-past six, and found the baby semi-comatose: skin cold and clammy; pulse slow, about 60 beats per minute; pupils contracted to the size of a pin's head. It was limp and motionless, neither cried nor moved, and could not hold up its head alone. By jumping it and slapping it we managed to make it keep its eyes open for a little while at a time, when it would immediately relapse into stupor. The spasms did not recur. The pupils were insensible to light. There was no vomiting or purging. So long a time having elapsed since the poison was taken, and, it being a small soluble powder, I deemed it useless to administer an emetic. The mother had given a little weak coffee, but it had great difficulty in swallowing; it seemed as if the child might stop breathing any minute. I applied mustard to its breast, legs, and feet, wrapped it up well in a flannel blanket, and kept it in motion, with only short intervals to rest, when I forced down its throat small spoonfuls of strong black coffee,—that is, coffee without milk or sugar. I continued my efforts in this way till eleven o'clock, when I left, with directions to continue in the same manner as long as the child could swallow the coffee. When I called next morning the baby appeared quite natural: its pupils were almost normal, its appetite had returned, and, in short, it made a perfect recovery. The mother informed me that they continued to administer the coffee and to jump the baby till twelve o'clock, when it fell asleep so soundly that it was impossible to wake it. It slept till morning, when it awoke with a cry, the first it had uttered since taking the morphine. I believe this is the largest amount of *morphine* (one-twelfth of a grain) ever recovered from by an infant of this age (six weeks). Young children are said to be peculiarly susceptible to the effects of opium. There are numerous cases on record where 4 or 5 drops of laudanum have caused death in children several months old. This amount of morphine represents about *thirteen drops* of laudanum, and, as no physician would think of giving over ½ a drop to an infant under six months of age, the magnitude of the dose becomes apparent. In those cases where large doses of laudanum have been taken with impunity by children (and adults as well) the strength

of the tincture of opium is always open to question. Powdered opium or morphine, of course, do not vary.

CASE II.—Last July I was called to see the only child of my next-door neighbor, a little girl, 2 years and 3 months of age. About six o'clock in the morning, while playing with a bottle of liniment, composed chiefly of laudanum, tincture of arnica, and alcohol, she swallowed some of the mixture. Just how much could not be ascertained, as some had been spilled. As soon as the mother discovered what the child had done, which was at least half an hour afterwards, she gave it a large dose of syrup of ipecac, which induced copious vomiting. When I saw the child, which was about half an hour later, she presented the usual signs of opium-poisoning. The face was pale, the skin cool, the pulse slow, the pupils strongly contracted, and the eyes had a dull, stupid, sleepy look. If left alone she would drop on the floor and fall asleep. It was with the utmost difficulty that we were able to keep her awake by walking around the house, slapping her on the back, etc. She also scratched her nose frequently, as though it itched. I immediately administered 8 drops of tincture of belladonna, and also gave her some strong black coffee. I repeated the draughts of coffee at short intervals till she had taken a large coffee-cupful. We walked her about the house and out of doors, in the mean time, till she was too tired to walk any farther, when we kept her awake by jumping her, trotting her on the knee, etc. It was with the greatest difficulty that we kept her awake till nine o'clock, when she began to grow better. The pupils now commenced to dilate, and the face and nearly the whole surface of the body was suddenly covered with the bright red efflorescence peculiar to belladonna. We kept her awake till twelve o'clock by talking to her and amusing her, after which I allowed her to go asleep. She slept nearly all the afternoon. The pulse and respiration being regular, I saw no reason for depriving the child of rest. When she awoke she appeared perfectly natural, the eruption had disappeared, and she ate her supper as usual. There were no further unpleasant symptoms. In this case it was obviously impossible to say how much laudanum had been taken, but the symptoms showed that a toxic dose had been swallowed.

I am unable to decide—in the second case—which remedy, the belladonna or the coffee, exerted the greater antidotal influence. Improvement took place immediately after the physiological effect of the belladonna manifested itself. Still, if I were restricted to the use of but one remedy I should prefer to depend upon coffee. However, there is no objection to using them together, as in this instance, and it is rational to believe that it is an advantage to do so.

REPORT OF CASES IN WHICH APOMORPHINE WAS USED.

BY T. OLIVER TAIT, M.D., ROCHESTER, NEW YORK.*

1. THE patient had taken, it was claimed, laudanum, ℥i. He was in a very stupid condition when brought in by patrol-wagon, having a heavy load of whiskey besides. He was given ⅛ gr. apomorphine, and emesis followed in about three minutes. Recovery.

2. Man, who had taken a large quantity of laudanum, arsenic, and chloroform mixed. He was bound to die; was unconscious, pupils dilated, rapid pulse and respiration; was given apomorphine, gr. 1/12. Free emesis followed in about one minute, and vomiting continued for several hours. He recovered completely in four days.

3. Patient brought in unconscious; pupils contracted; respiration slow and labored; history of having taken a quantity of laudanum and chloral. Gave three doses of apomorphine, each 1/12 gr., with very little effect. Emesis was brought on, however, in about ten minutes. The patient died about three hours afterwards.

4. Patient with history of having taken carbolic acid, besides having a large quantity of whiskey in the stomach. Gave her apomorphine, gr. ⅛. Emesis, very free, followed in four minutes. Washed out stomach with warm water, and followed by white of eggs. Patient made rapid recovery, was discharged in two days, but had a very sore stomach. Her urine revealed carbolic acid.

5. Patient brought in with extreme convulsions. He required six men to hold him down. I could get no history of the case from those around except that he was perfectly well three hours before, and that he was taken with a fainting fit, which resulted in convulsions. I was nonplussed, and gave morphine, gr. ½, hypodermically. This quieted the man, but he acted as though his stomach was troubling him. So, ten minutes later I gave apomorphine, gr. ⅛, with excellent re-

* Resident at Rochester City Hospital.

sult, but action was slow, about five minutes elapsing after giving it. Five hours later repeated morphine, gr. ½, and the next day patient was quiet, but very sore. He eventually recovered.

6. Poisoning by "Rough on Rats." Apomorphine, gr. ⅛, given. Free emesis followed in one and a half minutes. Patient died.

7. Another took "Rough on Rats." One hour after was given apomorphine, two doses, gr. ½ each, with good result. Patient recovered in four days.

CLINICAL OBSERVATIONS ON MANZANILLO.

A paper on the clinical observations of manzanillo was read by DR. A. BETANCOURT at the Clinical Society of Havana, held November 9, 1888, of which the following is an abstract as reported by G. D'Archy Adams, M.D., in the *London Medical Recorder* for February, 1889:

Manzanillo is a tree growing near the mouths of rivers and coasts of the West Indies and the continent of America. It belongs to the natural order *Euphorbiaceæ*. All parts of the plant contain a milky juice, most abundant in the bark and fruit. It is said the Indians used this juice to poison their arrows. Applied to the skin it causes inflammation and blisters. Internally, in doses of 18 to 20 drops, it gives rise to a sensation of burning in the mouth and stomach, diarrhœa and choleraic vomiting, cramps, giddiness, profuse sweats, coldness of the extremities, emphysema of the head and face, syncope, and death. Alcohol is the best antidote. Medicinally it is given with honey, one part to three, 2 or 3 drops in milk. This dose has absolutely no taste, and produces generally ten or twelve actions of the bowels, without pain; 5 or 8 drops will cause from twenty-five to thirty actions, with colic and vomiting. In certain parts of Cuba it enjoys great repute as a remedy for tetanus. Dr. Betancourt reports three cases in full in which he gave it, in combination with chloral and other sedatives, apparently with advantage; in five other cases, which ended fatally, it answered well as a drastic, and notably modified the tetanic symptoms. In dropsy—dyscrasic, cardiac, renal, and hepatic—it is very useful. The author's experience here extends over fifty-seven cases. In conclusion, he says, "Manzanillo is a drastic purgative, having, moreover, a marked diuretic action, notwithstanding that it depresses the circulatory system. It is constant in its effects, tasteless, and in small doses causes no pain or nausea. Of its influence in tetanus, he is doubtful whether the reputation it enjoys is owing to its energy as a drastic purgative or to its depressant effects on the nervous system. It is certainly useful, and never fails as a purgative, and the smallness of the dose is also a recommendation. In cases of cardiac dropsy, in which it is often necessary to give hydragogue cathartics daily over a lengthened period, manzanillo is frequently better borne than any other drug." Dr. Betancourt has given it extensively for the last four years, and is very favorably impressed with its properties.

NUX VOMICA IN CARDIAC FAILURE.

In the *Lancet* for March 2, 1889, DR. A. BOWIE reports the case of a lady, aged 42, who had suffered more or less for three years with bronchitis and mitral stenosis. When Dr. Bowie was summoned to her side he found her with face pale and anxious, and lips livid; the breathing was short and rapid, and pulsation at the wrist could scarcely be felt; nausea and occasional vomiting of mucus were present, and there was dread of taking food or lying down. The condition had commenced ten hours previously with epigastric pain; but while the other symptoms had increased in severity, the pain seemed to have remained stationary. Dr. Bowie prescribed tincture of nux vomica in small doses every half-hour for four doses, then every hour, and there was rapid return to her normal condition. A second case was also reported of a gentleman, aged 49, who had suffered for some years with mitral-regurgitation and persistent though mild bronchitis. Exposure had produced an attack of left lobar pneumonia, which had been running the usual course until the fifth day, when a dense fog occurred in his district. When Dr. Bowie was called to him, he found his pulse weak, rapid, irregular, and easily compressible; the extremities were cold, with clammy perspiration all over his body, and beads of the same upon his livid countenance. He complained of intense pain over the apex of the heart, and the breathing was short and hurried. He had been taking digitalis for two days previously to the attack. This was at once stopped and the tincture of nux vomica substituted. The result was the patient rallied, and in twenty-four hours had lost his cardiac pain entirely.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
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Leading Articles.

CHRONIC ARSENICAL POISONING.

IN the *Boston Medical and Surgical Journal* for March 7 and 14 of the present year is an article by Dr. James J. Putnam, of Boston, who is already specially known to the profession for his valuable researches in chronic metallic poisoning, which suggests that in many regions of the United States there are occasionally cases occurring whose true nature ought to be made out, but is, in fact, not discovered.

In twenty-five years of practice in and haunting of hospitals in Philadelphia we have never seen a case of chronic arsenical poisoning diagnosed, except when the poisoning was due to the introduction of the metal by the mouth, and yet Dr. Putnam in the course of a comparatively short period has seen twenty-six cases of poisoning from the inhalation of emissions from arsenic wall-papers. If Massachusetts were the land of Erin, and green were the national color, patriotism evincing itself by verdant walls might in some way explain the discrepancy; but we know of no reason for supposing that the arsenical colors please the æsthetic eye of the Bostonian any more than they do the untutored mind of the Philadelphia savage, and we can perceive no grounds for believing that chronic arsenical poisoning is more frequent in one city than the other.

The suspicions excited by Dr. Putnam's paper are confirmed by our noticing in the *British Medical Journal* of March 19, 1889, that the occupants of two certain bedrooms constantly complained of headache, nausea, lassitude, and that the wall-paper was found to contain an exceptionally large quantity of arsenic, and recovery followed the changing of the paper.

Under these circumstances it becomes a matter of the gravest importance to make out if possible the characteristic symptoms of chronic arsenicalism, or at least to discover something which will serve to arouse suspicion when present in a chronic case of disease. Many years ago Kirchgasser called attention to a peculiar browning of the skin, especially of the face, as indicative of chronic arsenical poisoning, and the same writer asserts that a periodic recurrence of symptoms is frequently seen, suggesting the intermittence of malaria. Cerebral symptoms, such as vertigo, impairment of memory and mental endurance, and, rarely, epileptiform seizure, are met with in cases of chronic arsenical as in lead-poisoning, and may be suggestive if not characteristic, provided other causes can be excluded. Fever of low grade, albuminuria, with casts and sometimes blood in the sediment, are other symptoms which might arouse suspicion. We think, indeed, that in every case of acute albuminuria search should be made for the possible presence of arsenic in the urine, unless circumstances surrounding the case clearly point to some other cause. Putnam calls attention especially to neuritis of sufficiently advanced type to cause changes in the electrical reactions, diminution of cutaneous sensibility, and impairment of motor-power or co-ordination as especially indicative of arsenical poisoning.

Neuritis is, indeed, an affection which is so commonly dependent upon the presence of poison in the system that it should always cause a very careful search for the probable toxæmia. In the majority of cases it is due either to gout, rheumatism, lead, or arsenic; very rarely to syphilis. The symptoms of local irritation of the alimentary canal are also frequently present in arsenicalism. A symptom which was quite marked in some of Dr. Putnam's cases was swelling of the sublingual and submaxillary glands, evidently

connected with congestion of them, and accompanied by excessive salivation, increased by mastication. Nausea, diarrhœa, and abdominal pain are not rare symptoms. In some cases sore-throat, cough, general debility, feverishness, anæmia, obscure failure of health, and even glandular enlargement about the neck were the only manifestations produced by the poison which was sapping the vital strength. Periodic attacks of violent gastralgia seem to be not rare.

In the case of an infant reported by Dr. Putnam, refusal of food without apparent cause was the only symptom. In another instance a young lady became extremely anæmic, and suffered from repeated attacks of diarrhœa. In another case prostration, insomnia, and indigestion were almost the sole manifestations. In this case the peculiar silvery coat upon the tongue, said by some physicians to be almost characteristic of chronic arsenicalism, was well marked.

It is evident that there are no symptoms in chronic arsenicalism which are constant, and none which are absolutely characteristic. In this, as in other toxæmias, the thing which ought to excite suspicion and cause a very careful search is not the presence of this or that symptom, but the irregularity of the progress of the case, and the failure of the array of symptoms to conform to the type of any ordinary disease. The only safeguard for the practitioner in chronic diseases is a perpetual mental alertness, a habitual, thorough search into the surroundings of every patient who offers an obstinate irregular chronic disorder without obvious explanation.

In all of the cases reported by Dr. Putnam arsenic was found in the urine; and in any individual case the diagnosis must rest upon a chemical study of the urine. It is worthy of record that in one or more of the cases the source of the poison appears to have been paper on the walls which had been covered over by other paper,—another instance of the bad result of the filthy habit, so prevalent in America, of putting paper on paper upon walls in order to save the small expense of removing the old paper. The habit is comparable to stealing pennies off of dead men's eyes, or to the economy of a recently-deceased Philadelphia millionaire who always carried an envelope in his pocket in which to put the half-chewed cuds of tobacco to save for another time, so that he might get along upon the five cents a week which he allowed himself for tobacco.

The following, bearing upon the time at which the elimination of arsenic ceases after its ingestion, seems to us worthy of being copied in full from the paper of Dr. Putnam:

"Even Taylor ('On Poisons'), while asserting the general principle of rapid elimination, admits by inference that the process may be delayed if the eliminating organs are working as they should.

"1. Two cases have already been reported (Cases 6 and 8) where the elimination was apparently going on for seven to nine months after cessation of the exposure, though it must be admitted that this class of cases is not suitable for conclusively settling such a point. The steady improvement and eventual recovery of the patient seemed to indicate that the real cause had been found, but it is possible that absorption went on for a time from the accumulations in the air of the house, or in the form of dust.

"2. A similar case to these, with elimination continuing for three months, is given by Kjellberg.*

"3. A case of poisoning from medicinal doses is cited in a paper previously published by myself,† where the arsenic did not disappear from the urine for nearly fifty days.

"4. A case is reported above (Kirchgasser) showing that the fæces may contain arsenic after elimination by the kidney has ceased.

"5. The most important case is one given by Gibb in the 'Transactions of the Pathological Society of London,'‡ where traces of arsenic were found in the liver and bones six months after cessation of a long course of medicinal treatment which had led to paralysis and eventually to death.

"One reason, perhaps, that it has been so strongly asserted that arsenic does not accumulate is that it has been supposed that arsenic did not form definite compounds with the albuminoid tissues of the body. This view is, however, disproved by the recent experiments of Dogiel, the last series of which are reported in the 'Transactions of the International Congress at Copenhagen in 1884.'"

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* "Hygeia," 1881, cited in Virchow, and Hirsch's, J. ber. 1882, l. 398.

† Boston Med. and Surg. Journal, 1888, vol. ii. p. 1.

‡ See the Boston Med. and Surg. Journal, 1888, vol. ii. p. 1.

BALSAM OF COPAIBA.

ACCORDING to the *Pharmaceutical Record* for March 18, 1889, the growing use of this oleo-resin in the arts has produced such a demand for it that the supply has not been able to keep pace with the increased call, and the price has advanced. This in turn has led to adulterations of the balsam, so that at present there is very little of it in the American market that is pure, as is strongly evinced by the fact that the ruling price in England is twenty per cent. greater than in this country, although the balsam comes to this country chiefly through England. It appears that in England, and more especially on the continent of Europe, it is largely adulterated with gurjun balsam, or wood oil, with oil of cedar, and often with such cheap stuff as rosin oil. Very frequently the three foreign substances of adulteration are used together with a little true balsam. This adulteration has gone so far that caution is necessary in the medicinal use of the balsam of copaiba unless it is procured from a thoroughly reliable apothecary.

INHALATION OF THE IODIDE OF MERCURY IN TUBERCULOSIS OF THE LUNGS.

ACCORDING to the *Pharmaceutische Post* for March 3, 1889, Miquel and Rueff have recently recommended the inhalation of the biniodide of mercury in tuberculosis, basing their opinions on a long series of careful observations made at the bedside. The result of this method of treatment, according to the authors, is a very satisfactory one,—often after its first administration the cough is reduced, and the expectoration, even in individuals with large cavities, becomes reduced in quantity and loses its offensive odor. As a result of its continued employment, it is claimed that night-sweats disappear and the general condition becomes improved, the body taking on weight. Their method of employment is to dissolve one part each of biniodide of mercury and iodide of potassium in one thousand parts of distilled water. This solution is employed in the form of a spray, at first only once daily, and later, when the patients have become accustomed to it, twice daily. If it is found that the irritation from inhalation is too excessive, the solution may be reduced one-half in strength without the result being affected, since it is claimed that this preparation of mercury will destroy bacteria in concentration of one to forty thousand. One of the chief conditions of success is to prolong the use of the treatment, which may be carried out for a year or more without evil effect to the patient. If we admit that phthisis is due to the presence and growth of a bacillus, the use of such a bacteriacide would be indicated on theoretical grounds, and, as the authors' experience seems to prove that its use may be persisted in without danger to the patient, it is certainly worthy of trial.

ANEMONE PULSATILLA IN THE TREATMENT OF GONORRHŒAL ORCHITIS.

IT is only in the last five or six years that internal treatment of gonorrhœal orchitis has been attempted, for, while quinine and general supporting treatment is the rule, it was only in 1882 that Dr. Henderson first recommended the internal use of salicylate of sodium in such cases, and in 1886 a report of twenty cases was published by M. Pigornet in which the internal administration of from forty-five to ninety grains daily of this drug is claimed to have led invariably to a successful result. Recently M. Dormand in his inaugural thesis (*Revue Générale de Clinique et de Thérapeutique*, March 7, 1889) has recommended in the strongest terms the employment of the tincture of anemone pulsatilla in the treatment of this affection. The use of this drug in orchitis is by no means novel. It was first used in America by Dr. Chambers, of Chicago; then in France by Martel, Cordier, and Bazy,—the latter of whom, according to Dr. Dormand, succeeded in rapidly curing thirty-five out of forty-eight cases, the pain disappearing from the first to the third day. Preference is given by Dr. Dormand to the tincture, which, sweetened with sugar or syrup, may be given in doses of 30 drops every two or three hours. Anemone pulsatilla is stated, in its action on the nervous system, to closely resemble aconitine, and it has been tested by Dr. Huchard in the treatment of various neuralgias in doses of from 30 to 60 drops; but the results so obtained have been so inconstant as to warrant no expression of any decided opinion. Dr. Curie has made a number of experiments to determine the physiological action of the glucoside of the anemone, and writes that in poisonous doses it produces general paralysis of voluntary motion without affecting the respiratory or circulatory functions or general sensibility. According to Bronevski, anemonin paralyzes the heart and respiratory centres, causing in the lower animals dyspnœa, paralysis, diarrhœa, and arrest of the heart. In doses of 4½ grains the glucoside has

been employed by Dr. Curie in the treatment of chorea with good results. The use of the alcoholic extract has been recommended by Vigier in the treatment of catarrh, and is stated to completely arrest nasal secretion. It should be recollected, in experimenting to determine the value of this drug, that anemone loses all active properties on drying, —and preparations, therefore, should be invariably made from the fresh plant, collected in the month of June.

CLINICAL NOTES OF SULPHONAL.

WE have already called attention to the fact that the indiscriminate use of sulphonal as a hypnotic, without fear of evil results, is not substantiated by facts. Dr. S. Grover Burnett (in the *New York Medical Journal*, March 2, 1889) publishes notes which further confirm these statements. He first experimented on himself, taking 30 grains, and, while sleep was produced in an hour and lasted for eleven hours, he awoke with dizziness, which passed away on rising; but he suffered from muscular weakness which lasted all day, his co-ordinating powers being quite defective. He has used it in sixteen cases of mental disease of various kinds, with good results in seventy-five per cent. of the number experimented upon, but in all cases of melancholia and one case of epileptic insanity the results were less satisfactory. In melancholia the dose had to be repeated during the night, and then only from two to four hours' sleep was obtained. To a patient with melancholia with great mental disturbance a dose of 30 grains was given at bedtime: the patient did not sleep, and the dose was repeated at 2 A.M.; patient then slept till 1 P.M. On waking, refused food and complained of nausea. Became restless at bedtime and the dose was repeated; slept all night, and was aroused with difficulty at 9 A.M. Was cyanotic; pulse 60, weak, and compressible; respiration 16, and laborious; temperature 98° F. Remained cyanotic and semi-comatose for twelve hours, taking no food. On the following day the temperature was normal, respiration 20, pulse 80, taken in same attitude. Patient is 59 years old, suffers from artero-sclerosis with compensatory cardiac hypertrophy, to which condition Dr. Burnett attributes the severity of the symptoms, and he thinks the patient would not have survived another dose within twenty-four hours.

To a lady, 42 years old, suffering from insomnia due to worry, 30 grains of sulphonal were given at bedtime for a week. It produced good sleep, but was followed each morning by anorexia, slight headache, and, on the fifth day, muscular inco-ordination. These symptoms gradually increased, becoming so severe on the seventh day that the medicine had to be discontinued. In three cases it produced extreme thirst, dry and parched condition of the mucous membrane of the mouth, partial suppression of the salivary secretions, anorexia, and in two cases pronounced emesis. Dr. Burnett believes that sulphonal is a reliable hypnotic in the various psychoses free from states of depression, such as mania, the maniacal stage of paresis, delusional insanity, etc., while it is less suitable for cases of melancholia with pronounced depression; is contraindicated in arterio-sclerosis concomitant to a psychosis. He believes that it is accumulative, producing a more profound effect after the third dose, six to twenty-four hours apart, and in a small number of cases produces disorder of the digestive secretions.

While the cases in which sulphonal has failed to produce the expected result, or has even been followed by unfortunate consequences, are rapidly multiplying, it is earnestly to be hoped that the drug will not on this account fall into disrepute. In our minds it is without doubt one of the best of hypnotics, but like all powerful agents cannot be used indiscriminately. In some cases its use is positively counter-indicated and in others it will fail; fortunately we are now beginning to recognize on clinical grounds the restrictions which should govern its use. Further, our acquaintance with its physiological action is becoming more intimate and has been considerably improved by the report of a number of experiments made by Dr. William F. Shick in the private laboratory of Dr. Ott as to the physiological action of sulphonal ($SO_2C_2H_5)_2$, from which the author draws the following conclusions (*Journal of Nervous and Mental Disease*, January, 1889):

1. It does not affect the irritability of the motor nerves.
2. It does not alter the muscle curve.
3. The sensory nerves are left intact.
4. It depresses reflex activity mainly by an action on Setschenow's centres; occasionally it exalts reflex excitability.
5. It acts as a narcotic.
6. The pulse is usually somewhat accelerated.

7. The arterial tension, after a temporary fall, is considerably increased.

8. Respiration is depressed; section of the vagi does not alter the effect.

These facts lead him to believe that sulphonal will replace chloral to a considerable extent. The well-known dangerous action of chloral as to heart and respiration is avoided with this drug, and, if the narcotic effects are equal, sulphonal should have the preference. While he has seen the heart paralyzed by the drug in a few minutes, yet it was due to the sudden action of the drug by the jugular and perhaps partly to some of the drug being thrown down on account of its insolubility, for the solution was somewhat warmer than the temperature of the blood.

Reports on Therapeutic Progress.

PROFESSOR VON BERGMANN'S CASE OF CEREBRAL ABSCESS.

In our January issue we published an account from our Berlin correspondent of Professor von Bergmann's case of cerebral abscess. The account of this case has excited considerable discussion in Berlin, and the following letter from the Berlin correspondent of the *Medical Press*, January 30, 1889, will probably prove of considerable interest to our readers. Herr Hartmann first gave some particulars regarding the case described before it passed under Herr von Bergmann's care. The principal symptom accompanying the purulent discharge was violent alternating headaches. Motor or sensory symptoms were not observed, but sluggish reaction and irregularity of the pupils were. The conclusion was strange to him (the speaker), however, that otiatry left them in the lurch in suppuration of the middle ear, that ear surgeons drive septic material inward by their syringing instead of outward. He was in agreement with English surgeons who had lately had the greatest success in operation with cerebral abscess, and who demanded that the tympanic cavity should be brought into a clean condition before operation. He did not believe otiatry would leave Herr von Bergmann in the lurch if he would call it in to his aid. Syringing out of the middle ear was general, and followed by the best results. He did not deny that the disease might be influenced unfavorably by syringing, but so long as such cases remained exceptions they did not furnish a reason for abstaining from the procedure.

Very reliable statistics as to results were furnished by Bezold. Of four hundred and forty-six cases of suppuration of the middle ear, cure with closure of the tympanum occurred in 2.3 per cent., permanent cure of the suppuration without reclosure in 54.1 per cent., traces of the suppuration remained in eleven per cent., twenty-three per cent. were seen only once or a few times, and 7.2 per cent. remained under treatment. A fatal result took place in seven cases, 1.6 per cent., and when four cases in which death was not in direct connection with the affection (phthisis, scarlatina) were deducted, there only remained .7 per cent. in which death was produced by the ear affection. Such was the position up to the present; when ear surgeons were shown a method of treatment that gave better results they would certainly be prepared to accept it.

Herr von Bergmann took his stand on the ground occupied by the previous speaker. Certainly several cases of cerebral abscess had already burst into the ventricles. This was easy to understand, for when they began to give rise to symptoms they progressed rapidly. Expectancy was here a dangerous thing. In the present case there could be no question of pus being driven inward, but notwithstanding, and although he was not in a position to offer anything better, he must say there were many objections to that mode of treatment, and above all when it was observed with how much energy the syringing out was undertaken. Various authors had previously uttered a warning against energetic syringing, but in spite of it he had seen it performed with such vehemence that he believed he ought not to keep silent respecting it. Surgeons looked upon syringing out in other regions as a misfortune; for example, the pleural cavity; and, as this was the case, it was only to be wished that ear surgeons would employ less force in their syringings. If a series of good results were obtained by syringing it would be no proof that the procedure was an indisputably good one. Syringing acted injuriously in all other wounds; in gunshot wounds, for example, it drove inflammatory products into the interstices that had not before suppurated, and gave rise to phlegmons in these cellular tissue spaces. It was, therefore, emphasized that the vessel should not be held too high, but that only a gentle stream should be allowed to flow into the wound.

Herr Küster had chiselled off the mastoid forty times in thirty-nine cases; of this nu-

ber he had lost six, four of them from cerebral abscess. These cases, however, belonged to a period when people were not accustomed to attack cerebral abscess so early as at present. Two patients died of meningitis; in one case, when the skull was opened, pus welled out between it and the dura mater. These unfavorable results must not be attributed to the operation, which was harmless in itself. According to his observation, it seemed advisable to undertake the chiselling of the mastoid early in those obstinate cases that did not yield to ordinary treatment, as it frequently enough cured the disease. Two groups of cases must be distinguished,—viz., those in which the disease was primarily located in the mastoid, and spread to the ear, and those in which it was secondary to disease in the ear. The greater number of cases of cholesteatomata belonged to the first group: he had observed seven such cases; when these were freed, removed by scraping, and tamponed, the suppuration at once ceased. Further, the cases of primary tuberculosis of the mastoid belonged to this group. When the caseous centre was removed healing took place. A third affection was primary osteomyelitis of the mastoid process, for as no bone in the skeleton was safe from attack, it was only natural that this might be the seat of the disease.

As regarded the second group of cases, too long waiting was not demanded. When rational treatment was carried out for weeks, and the discharge did not lose its fetid character, it was necessary to proceed to operation. He had proposed a double operation, according as the ossicles still remained with perforation, or the tympanum was completely destroyed. In the latter case no regard need be paid to hearing; it might be looked upon as lost. In such cases, therefore, he chiselled into the middle ear, and inserted a drainage-tube, one end of which passed out through the external ear. In this way pus was prevented from collecting, and healing promptly took place. In those cases, on the other hand, in which the tympanum and ossicles were retained, one would content one's self with chiselling away the bony canal from within outward, from the tympanum, and inserting a drainage-tube. The cleansing is not then so complete, but it is possible to syringe out without using much force. He had been quite contented with the results, and he would, therefore, in closing, say decidedly that early chiselling of the mastoid was much recommended.

THE CURATIVE TREATMENT OF CYSTITIS IN WOMEN.

In a paper published in the *British Medical Journal*, March 2, 1889, DR. THOMAS MORE MADDEN calls attention to the fact that cystitis in women is more frequently met with than is generally believed, and is most intractable to the methods generally relied on for its relief; and since he states that in the past year twenty-eight cases of this affection have come under his care, and that in nearly every one of these cases the patient was discharged free from disease, which in some of them had resisted years of other treatment, this fact renders his remarks worthy of notice. As regards the cause of cystitis in the female, he found that it frequently occurs as a complication or consequence of vulvar or vaginal inflammatory conditions, especially when they are of gonorrhœal origin; or it may be due to mechanical causes, uterine flexions or displacements, and fibromata. Occasionally it results from the extension of the renal disease or from the irritation of gravel or calculi, as well as from cold, local injuries, reflex irritation, or simply from long delay in emptying the bladder. In the treatment of these cases it is obvious that the first care should be to ascertain and remove, if possible, the exciting cause of the morbid condition of the bladder. Thus, if the disease be dependent on extension of vulvar or vaginal inflammation, either gonorrhœal or non-specific, this must be at once allayed by appropriate treatment. If the cystitis be due to the mechanical pressure of a displaced uterus, this should be rectified by a suitable pessary. In the same way the weight of a uterine fibroid pressing on the bladder, if it cannot be otherwise got rid of, must be at least lifted well above the pelvic brim, and there maintained. If vesical calculus be present, or if, as should be ascertained by careful examination of the urine, renal disease exists, and has extended from the kidneys along the ureters, it will be useless to attempt the topical treatment of the consequent cystitis until in either instance its cause has been removed.

Should, however, the case be one of uncomplicated cystitis, some of the numerous palliative expedients are unquestionably of value, and may even prove curative in exceptionally mild cases of the disease. Of these the most generally useful in this way are long-continued warm baths, washing out the bladder through a double catheter with plain warm water, thin flaxseed-tea, or a solution of boro-glyceride; conjointly in all in-

stances with absolute rest in bed, the free use of diluents, together with the administration of the old-fashioned Dover's powder in small, frequently-repeated doses as the best opiate in these cases; and, lastly, above all, by the use of boracic acid in 10- or 13-grain doses three or four times a day, by which the generally fetid ammoniacal urine is deprived of its fætor and rendered less irritating to the endo-vesical mucous membrane.

While these measures may relieve, they will not cure well-established cystitis. This can only be attained by giving the diseased lining membrane of the bladder and its submucous muscular walls absolute physiological rest. This may be secured in either of two ways,—namely, first, by that advocated by Dr. Emmet on the suggestion of the late Dr. Marion Sims, which consists in the formation of an artificial vesico-vaginal fistula through which the urine may drain away as fast as secreted, and by the consequent removal of the immediate source of irritation to the unhealthy and hyperæsthetic endo-vesical mucous membrane thus affords the patient a fair chance of escape from ultimate extension of the disease to the kidneys. The objections to this plan of treatment are, however, so grave as to render any rational alternative that may be suggested for attaining the same object by less heroic means deserving of fair consideration and full trial. These objections are: first, the general difficulty of keeping the fistulous opening patulous for a sufficient time to allow the diseased bladder to regain its normal condition; secondly, the irritation often occasioned by the button commonly employed for this purpose; and, thirdly, the more serious trouble, which we meet with in some exceptional instances, of closing the fistulous opening when the desired object has been attained, and the consequent misery resulting from this mischance, by which the patient's last condition may thus possibly be rendered worse than her former state.

For these reasons Dr. Madden has abandoned this operation, and believes that we may obtain its advantages more easily and more safely simply by so thoroughly dilating the urethral canal as to enable one to pass the index-finger into the bladder, and paralyzing the contractility of the sphincter for a time. In some instances it may be advisable to remove the proliferating vesical mucous membrane by the cautious employment of a dull wire curette, while the topical application of carbolic acid to the mucous surface should be combined with dilatation. The carbolic acid should be employed in the form of glycerin of carbolic acid, which is quite strong enough for the purpose, introduced by an ordinary stilette, armed with a piece of absorbent cotton saturated in the application, and passed through a dilator so as to avoid any of the acid being brushed off in the canal until it reaches the fundus vesicæ, where it should be retained for a couple of minutes until every part of the vesical wall contracts. The urethral canal is then to be similarly brushed out by another application of the carbolized glycerin. The pain caused by the procedure may be prevented by previously introducing in the same way a ten per cent. solution of cocaine. Dr. Madden states that this plan of treatment seldom requires to be repeated more than two or three times, at intervals of a week, to cure the most aggravated cases of cystitis in women.

A NEW STUDY OF LOBAR PNEUMONIA, WITH DEDUCTIONS FROM AN ANALYSIS OF FIFTY-SIX FATAL CASES.

At the meeting of the New York Academy of Medicine, held December 20, 1888, Dr. Thomas E. Satterthwaite read a paper with the above title, of which the following is an abstract as published by the *Medical and Surgical Reporter*. Epidemic pneumonia, according to the author, does not prevail to any great extent at the present time, yet a certain number of facts sustain the theory that the disease is occasionally epidemic.

His paper treated of lobar pneumonia in its primary and secondary forms; the first form he called acute lobar pneumonia, and the other, secondary pneumonia. But to avoid obscurity he mentioned the principal types of pneumonia, which are acute lobar pneumonia, secondary lobar pneumonia, embolic lobar pneumonia, bronchial lobular pneumonia, and the interstitial pneumonia of heart-disease. Acute lobar or croupous pneumonia is the most common form. In one hundred fatal cases, taken from his hospital and private records, the several varieties were represented as follows: Acute lobar, thirty-six per cent.; secondary lobar, nineteen per cent.; bronchial lobular, twenty per cent.; interstitial of heart-disease, seven per cent. He has found it most common in males. It is for the most part a disease of middle life, and occurs almost altogether in northern and middle altitudes. When it originates in one lung it usually selects the right, and in half cases commenced in a lower lobe. In the stage of engorgement the whole lung tissue

increased in volume, infiltrated with a serous fluid, with more or less transudation of blood from the vessels. In the second stage, or stage of red hepatization, the lung is of a deep red color, unyielding to the touch, and difficult to distinguish from an inflamed liver. It contains little if any air, and almost no fluid. Its cut surface has a granular and dull aspect, each speck corresponding to an air-vesicle or cut bronchiole filled with a firm pellet consisting of blood-cells and epithelium mixed with fibrin, which hold all firmly together. In the third stage, that of gray hepatization, the reddish tint yields to a dirty gray, at first tinged with brown, and then with yellow; the tissue is softer, and on pressure exudes a small amount of fluid; the walls of the blood-vessels are studded with leucocytes; in many cases there is dark pigmentation of the interlobular spaces. The lung may weigh sixty ounces.

In Dr. Satterthwaite's experience the order of the symptoms is as follows: 1, pain, prostration, and cough; 2, a severe chill; 3, nausea; 4, rise of temperature. Chilly sensations may take the place of a severe chill. Within a few hours the temperature commonly reaches 103° or 104° F. An early sign, though seldom the earliest, is fine crepitation, heard only during inspiration. Occasionally this sign lasts the full course of the disease. As soon as the second stage begins there is dulness on percussion, with bronchial breathing and bronchophony, and also increased vocal fremitus. In the fourth stage, that of resolution, returning crepitant râle is heard. The author is inclined to think that the locality of the affection, whether in the upper or lower lobe, does not influence the production of cough or affect its character. In old people cough may be absent. The expectoration is peculiarly tenacious and variously colored. The characteristic prune-juice color is sometimes absent, and is replaced by a red, black, or green color, or the expectoration may be colorless. The characteristic sputum of pneumonia has three qualities,—color, consistence, and coalescence. It may appear on the first day, or not until the third or fourth. It is not always present, and may occur occasionally when no pneumonia exists, as in nasal or pharyngeal catarrh with hemorrhage, or in acute laryngitis. Diarrhœa is often present, and so are nausea and vomiting. The urine is often scanty. Albuminuria is common, and is usually most marked at the height of the disease. There was kidney-trouble in forty-one per cent. of his cases; in five per cent. of these chronic kidney-trouble of long standing existed; in only eight per cent. was it shown by clinical and post-mortem evidence that there was no urinary implication. The greatest danger occurs in an exacerbation of an old kidney-affection. Little has been added to our knowledge of the clinical aspects of pneumonia since the studies of Laennec. In the stage of engorgement we may expect to find dulness, but we do not. Grisolle found in this stage loss of elasticity in the chest-walls, especially when percussed in the supra- and infra-spinous fossæ. The crepitant râle was regarded by Laennec as the first pathognomonic sign. It is produced by fluid matter passing into the vesicles of the lung. In some seasons it is rarely heard; in old people it may be replaced by a coarse crepitant râle. Fine crepitation may be heard in other types of pneumonia, in pulmonary phthisis and syphilis, and even in bronchitis. Prolonged expiration precedes tubular or bronchial breathing. Bronchophony and metallic voice, when considerable area of dulness exists, are also signs. Pain is most frequent in the region of the nipple; next, at the base of the lung. It may be felt at any part of the chest. It is due to pleurisy. The pulse is usually 100 or more, and may reach 160. Jaundice is not very infrequent; delirium is common. Coma occurred in three per cent. of his cases; it is often uræmic. At first the respiration rises from 22 to 36 per minute, but within two days it may reach 40, 50, or 60. Inflammation of the lower lobe seems to produce more oppression than inflammation of the upper. In children the temperature reaches a greater height than in adults. It rises one or two degrees at night, and falls in the morning. The highest temperature in his case was 108°, the lowest 100.2°; ten cases the highest average temperature was 104.3°. The crisis usually occurs between the fifth and seventh days. Unless there are unusual complications or sequelæ it never occurs later than the fourteenth. The immediate cause of death is usually heart-failure from prolonged and exhaustive work, or from the influence of poisoned blood on the nerve-centres.

In speaking of the etiology, Dr. Satterthwaite quoted Sturges's opinion that it was produced by cold, dry, penetrating winds; some later writers, however, think cold an infrequent cause. Twenty-two per cent. of his own cases were ascribed to exposure to cold. The disease seldom occurs during the warmer months. Occupation has little bearing on the

causation. Regarding the influence of micro-organisms, it would be necessary, to prove that they are a cause, to show that a pure culture inoculated in the blood remote from the lungs would produce lobar pneumonia; but experiments have almost always failed in this respect, and when the lung itself has been inoculated, lobular (not lobar) pneumonia has commonly resulted. The pleura is always involved, except in the rare instances when the inflammation remains central. A comparatively frequent complication is pericarditis; a more important complication is disease of the kidneys. The spleen is apt to be enlarged, and there is catarrh of the intestinal tract. True abscess of the lung is rare. Gangrene was noted in his cases. He does not believe phthisis could ever develop from acute lobar pneumonia. The question of mortality, he said, has given rise to much dispute, largely because of indefinite statistics. Its discussion, to be of value, requires a knowledge of the variety, the patient's age, the general character of the attack. At some seasons the mortality is greater than at others, notwithstanding the same general treatment. Statistics before the middle of the present century give a mortality of from sixteen to fifty-five per cent. Just before the middle of this century, Skoda published statistics tending to prove that pneumonia is a self-limited disease. About 1842, Fleischmann, a homœopath, had a mortality of less than six per cent., which set other physicians thinking, and gradually led to less heroic treatment. The fact that the mortality varies in the hands of the same physicians shows that each case stands by itself. Dr. Satterthwaite's own experience shows that the expectant plan of treatment is best. The causes of death show what should be the direction of treatment. It should not be the reduction of temperature so much as the sustaining of the heart and obviating renal complications. The author has been led to believe by post-mortem studies that antipyretics not only weaken the heart's action, but also have some unfavorable action on the kidneys. Every case of acute lobar pneumonia should be treated by itself, and the indications met as they arise. He has often seen benefit from copious repeated cupping in sthenic cases. In less vigorous persons relief often follows cold water applications. In defective hepatic action relief has come from large doses of mercurials. In weak heart, patients have been carried through with alcoholic stimulants. In renal complications marked relief of pulmonary symptoms has followed remedies directed chiefly to the kidneys.

The author then passed to the consideration of secondary lobar pneumonia. This subdivision had been recognized by the old French school. His views of it are based upon nineteen of his recorded cases. Without committing himself to an opinion as to their etiological value, he has found the antecedent conditions as follows: Nephritis in 5; alcoholism in 2; phthisis in 2; burns in 2; rheumatism in 1; fracture of the ribs in 1; hypertrophy of the heart in 1; pleurisy with effusion in 1; pericardial effusion in 1. Contemporaneous affections were present as follows: Abdominal dropsy in 1; pericardial effusion in 1; gangrene of the extremities in 1; aneurism of the aorta in 1; bronchitis in 2; syphilis in 2; endocarditis in 2; hydrothorax in 1. Cases in which there was a suspicion of phthisis or syphilis were not included. Secondary pneumonia is usually insidious. Chill is frequently absent, and when present is not severe. Difficulty in breathing may not be marked. The crepitant râle is heard as a rule. The temperature rises rapidly, as in acute lobar pneumonia, but averages somewhat lower in range. The pulse often rises sharply at the outset, but averages lower than in the acute form. Bronchial breathing and dulness may be the most decided symptoms, and in his experience they have been the most common. The expectoration is apt to be scanty and afford little help in diagnosis. Renal symptoms are likely to be more prominent than in the acute disease. There is a decided tendency to suppuration. The duration is about the same as in acute pneumonia, but the crisis is likely to come earlier. The causes of death are about as in acute lobar pneumonia, and indicate the treatment.

NERVE-GRAFTING.

At the meeting of the Clinical Society of London, held January 25, MR. MAYO ROBSON showed a girl, aged 14, on whom he had successfully grafted two inches and a half of the posterior tibial nerve into a corresponding gap in the median nerve in the forearm (*Lancet*, February 2, 1889). He also showed the tumor which had involved the median nerve and had necessitated its removal. The history of the case, briefly, was that the patient had noticed the tumor growing for six years, but that it had grown more rapidly during the past twelve months, during which time it had caused considerable incon-

venience as well as deformity. The tumor, about the size of a hen's egg, extended from the annular ligament in front of the right wrist up the forearm for about three inches, reaching laterally from side to side, the skin being firmly stretched over but not adherent to the tumor, which appeared to be solid or semi-solid. On making an incision over the swelling the tumor bulged through the wound, and was easily separated from its cellular bed, leaving the mass attached above and below to a cord, which appeared to be inseparably blended with it. The attachments had, therefore, to be cut through. A microscopic examination showed that the cord was composed of nerve-tissue, and on the patient recovering from the anæsthetic, the parts in the hand supplied by the median nerve were found to be devoid of sensation. Arrangements were made by Mr. Robson to graft the sciatic nerve of a rabbit into the gap of the median nerve, but, fortunately, his colleague, Mr. Ward, kindly allowed him to arrange his operation at the same time that he was amputating a thigh, and to utilize the posterior tibial nerve, which was taken straight from the amputated leg into the prepared forearm, the transfer from one theatre to the other being made in a warm carbolic solution. Two inches and a half of nerve were utilized, the ends being attached to the proximal and distal portions of the median with a fine catgut suture, without the slightest tension either on the stitches or the nerve; the wound was well washed out with perchloride of mercury lotion and carefully sutured. Healing occurred by first intention. The grafting was performed forty-eight hours after the tumor had been removed; and thirty-six hours after the nerve had been grafted sensation had so far returned in the parts supplied by the median that the touch of a pencil could be localized. Day by day sensation became more and more distinct, until, when shown to the members of the Leeds and West Riding Medico-Chirurgical Society, five weeks after the operation, it was so perfect that the slighest touch could be localized, and although there was manifest diminution in volume of the abductor and flexor brevis pollicis, they were not completely paralyzed. Mr. Mayo Robson, after relating experiments on animals, which went to prove that reunion and even regeneration of nerves might occur, remarked that in such cases, where there had been absolute loss of nerve, return of function did not occur. He thought the case he had related presented very important physiological and clinical features: physiological, in that the living nerve must have immediately united and taken on function, so that thirty-six hours afterwards the distal portions of the median were functionally active; clinical, in that, if nerve-grafting to such an extent could be certainly relied on, many hitherto hopeless cases may be cured,—for instance, in injury of an extremity with destruction of one or more chief nerve-trunks, in the case of a tumor involving nerves, in paralysis due to cicatricial destruction of nerve, and in many other cases. He ventured to hope that, if, as in this case, two inches and a half of nerve would live, further experiments might show that greater lengths might survive; or, if such were found to be impossible, that the grafting might be done piece by piece, as in the case of bone-grafting. The condition which he advised to be observed in such operations were: first, entire absence of tension in the grafted nerve,—*e.g.*, two inches and a half being employed to fill an interval of two inches and a quarter; secondly, great care in dissecting out and handling the nerve; thirdly, immediate transference of the living tissue into its new bed; fourthly, the employment of only a single suture to fix the ends of the nerves; and fifthly, strict asepsis. He thought that this case, if he had correctly interpreted it, went to disproye the theory that a primary union of the divided ends of a nerve is only an appearance of union, and not a physiological one, and that the distal ends must pass through a process of degeneration before regeneration. He remarked that the return of function in the motor portion of the nerve was more gradual than in the sensory, and made suggestions which he thought might explain the difference.

Mr. Bryant asked whether the suture had included the whole thickness of the nerve.

Mr. Bowlby observed that the case seemed likely to prove a successful one, but at present it was not entirely so. It was the first recorded case of nerve-grafting in this country, although a number of experiments and operations had been published on the continent. This was the first case of primary grafting of a nerve,—that was, within forty-eight hours of the injury. He pointed out that in a certain number of instances there had been restoration without re-establishment of continuity of the nerve. He had quoted several instances of the kind in his lectures at the College of Surgeons. Still, on examining that particular

patient, he found more sensation than he had ever seen before under similar circumstances. The condition of the muscles was not quite healthy, but still satisfactory. He mentioned as a curious fact that the power of voluntary motion often returned long before there was any reaction to electricity. He had remarked a bulla on the tip of the patient's index-finger, which seemed to point to a trophic lesion. He questioned the accuracy of the view generally held, that after primary suture of the two ends of a divided nerve, the lower end necessarily underwent degeneration. In a case in which he had brought the ends together, although fully an inch had been cut out, complete restoration of function ensued in a few days. In another case in which union by primary intention took place, although there was no paralysis, yet for a long time there was no reaction to electricity. He also pointed out that sensation was a very vague term, and might exist in very varying degrees. Mr. Robson's patient still experienced numbness and tingling in the fingers, showing that sensation, if good, was not perfect.

MR. BLAND SUTTON urged that it did not follow, because restoration of function had taken place after joining the cut ends of the nerve by means of a piece of the posterior nerve, that the latter had become incorporated with the median nerve. In experiments that had been carried out on animals it seemed that anything which acted as a conductor, so to speak, along which the reparative material passed, bits of chicken-bone, catgut, etc., had been found to answer the purpose. The bullæ which had been noticed generally took some time to form, and he suggested that the patient was now getting the symptoms which would have followed had the grafting not been effected. He hoped that the future progress of the case would be carefully watched, and the additional information added to the report when published in the Transactions.

The PRESIDENT mentioned the case of a man from whom, in the course of an operation for the removal of a tumor, he had accidentally removed a large piece of the external popliteal nerve,—too much, in fact, to admit of the ends being brought together. Loss of sensation and muscular degeneration followed in the parts supplied by the nerve, and the patient left the hospital in a rather unsatisfactory condition as regarded the leg. Some months later he looked the patient up, and found to his surprise that function had been restored, and the patient said he was as strong in the leg as ever he was.

MR. MAYO ROBSON, in reply, admitted that the case was not yet an unqualified success, but its progress had been so uninterruptedly satisfactory that he quite anticipated it would ultimately become so. He had passed a very fine catgut suture through the whole thickness of the nerve. He observed that even if the piece of the posterior nerve had not become incorporated with the median nerve, yet, in view of the successful issue of the case, most persons would be inclined to commend the course that had been adopted.

THE POISONOUS ACTION OF THE "LOCO-WEED."

In the *New York Medical Journal* for March 2, 1889, DR. MARY G. DAY reports a number of experiments made upon cats with the decoction of the loco-weed (*Astragulus mollissimus* and *Oxytropis lamberti*) gathered in September. Symptoms of disturbance began to appear within two days, and in the following order: The kitten became less active, the coat grew rough, appetite for ordinary food diminished, and fondness for the "loco" increased, diarrhœa came on, and retching and vomiting occasionally occurred. The expression became peculiar and characteristic. Emaciation and the above symptoms progressively increased until the eighteenth day, when periods of convulsive excitement supervened. At times the convulsions were tetanic in character; frothing at the mouth and throwing the head backward as in opisthotonos were marked. At other times the kitten would stand on its hind legs and strike the air with its fore paws, then fall backward and throw itself from side to side. These periods of excitement were followed by perfect quiet, the only apparent sign of life being the respiratory movements. After a short interval of quiet the convulsive movements would recur. These alternate periods of excitement and quiet lasted thirty-six hours, when the posterior extremities became paralyzed, and the kitten died about two hours afterwards. There was no apparent loss of consciousness before death.

The post-mortem examination revealed the presence of ulcers in the stomach and duodenum. Some of the ulcers had nearly perforated the wall of the stomach and duodenum. The heart was in diastole; brain and cord appeared normal. As might be expected from the emaciated condition, the entire body was anæmic.

In a second case, sixty to seventy cubic

centimetres of a more concentrated decoction were fed daily, with other food as before, to a vigorous adult cat. The symptoms of inactivity, loss of appetite, rough coat, diarrhœa, and the peculiar expression of countenance were as in the first case. By the twelfth day the cat was wasted almost to a skeleton, and was correspondingly weak. Paralysis of the hind limbs came on, and the cat died on the thirteenth day. There were no periods of excitement in this case. Perhaps it was due to the amount of the poison given.

As a test experiment, two strong young cats were confined in the same place, fed from the same dish, and treated in every way the same, except that to one was fed daily a decoction of the "loco." The one fed "loco" acquired the "loco disease" with the characteristic symptoms described above, while the other, eating ordinary food only, remained healthy.

Some experiments were also made at the Michigan Laboratory of Hygiene, under the direction of Dr. Victor C. Vaughan. Subcutaneous injections of the concentrated decoction caused nervous twitchings in frogs and kittens, and, if large amounts were used, death followed in from one to two hours from paralysis of the heart. The same symptoms were produced in frogs by the injection of an alcoholic extract of the residue left after the evaporation to dryness of the decoction. The diarrhœa, which was so marked a symptom in the cats experimented upon, has apparently not been noticed as a characteristic symptom in horses and cattle poisoned with this weed, although Professor Sayre has reported an ulcerated condition of the intestines of a cow poisoned with "loco-weed" upon which he made an autopsy. As in cattle, the author noticed in cats that craving for the loco decoction was soon acquired, and from experiments on material gathered in different months that the greatest amount of poison is present in the autumn and winter after the seeds have ripened, thus explaining the great prevalence of the "loco" disease in these seasons. From the experiments the author draws the following conclusions:

1. There is some poison in "loco-weed" which may cause the illness and, if sufficient quantity is taken, the death of an animal.

2. This poison is contained in the decoction obtained from the plants, and by systematically feeding it to healthy cats cases of "loco" disease may be produced.

3. Taste for the green "loco-weed" may be experimentally produced in the jack-rabbit.

4. From the large quantity of the plant or the decoction required to produce the disease, the poison must be weak, or, if strong, it must be in very small amount.

THE EMPLOYMENT OF TANNIN IN TUBERCULOSIS OF THE BONES AND ARTICULATIONS.

Professor Andrea Saccharelli, of Parma, calls attention to the effects which follow the employment of this remedy in the form of a dressing in tubercular lesions, basing his conclusions partly upon a series of experiments made upon animals inoculated with tuberculous matter, and partly upon his clinical results (*Journal de Médecine et de Chirurgie*, February, 1889). It has been utilized in various lesions, such as ostitis, white tumors, fistula, resections, etc., employed either in the form of a powder or in the form of gauze soaked with an alcoholic solution of tannin. According to the author, this substance is a powerful aseptic and favors the reunion of wounds, while it has special anti-tubercular properties, since it is able to prevent the development of tuberculosis, and even destroys tubercles when they already exist. He believes that it is without doubt better than iodoform, while being more powerful and free from danger. In many cases he has also combined the internal use with its external application. In this latter respect M. Raymond also believes that tannin taken internally in tuberculosis is quite comparable to the action of mercury in syphilis.

Dr. E. Houzé of the Hospital St. Jean, Brussels, after having tried the tannin treatment on all his phthisical patients for the last year and eight months, states as the result of his observations that it gives excellent results in all stages of the disease, and especially in the condition where cavities exist. (*Lancet*, March 9, 1889.) Indeed, he has no hesitation in declaring that of all the different kinds of treatment for phthisis which he has tried this has given by far the most encouraging results. The dose he employs ordinarily is fifteen grains, which quantity is taken three times a day. It is, as a rule, well borne; where this is not so, it is ordered to be taken with meals. After the first few days the expectoration and the sweats diminish, the cough decreases, and in many cases the appetite undergoes a marked improvement. The majority of the patients suffered from some slight degree of constipation, though in some this feature was sufficiently marked to require treatment; while others, again, suffered from

diarrhœa. The character of the expectoration changed for the better, the sputa becoming white and frothy instead of green and firm. In some cases the diminution of the expectoration was followed by increased dryness of the cough, so that the patients complained that it fatigued them more; this was easily remedied by prescribing a few spoonfuls of syrup of codeine. The physical signs underwent a remarkable change for the better, at least those depending on auscultation, moist râles giving place to dry bronchi, and large gurgling râles decreasing progressively until they gave place to mere blowing respiration. These changes were evidently due to the drying up of the cavities, in consequence of which the hectic present in many of the cases vanished, the patients increasing considerably in weight and gaining strength in a remarkable manner. The percussion signs were not found to undergo so marked a change as those dependent on auscultation, but even here some improvement could be detected. No bacteriological observations were made.

THE VALUE OF WATER IN THERAPEUTICS.

At the meeting of the Medical Society of the County of New York, held January 28, 1889, Dr. Simon Baruch read a paper, entitled "The Value of Water in Therapeutics" (*Medical Record*, February 9, 1889).

The author contrasted the present position of water as a therapeutic agent with that formerly occupied by it, compared methods now in vogue with those of the past, and drew lessons verified by clinical experience. Most text-books devoted little space to water as a therapeutic agent.

His first experience with the use of water externally took place when he was army surgeon in the civil conflict. It was customary at that time to use water freely on wounds, and the results compared very unfavorably with those from the modern dry method; suppuration and mortification were common. Experience had demonstrated the value of boiled water in laparotomy, and also the fact that drugs added to render the water antiseptic would be less called for if the water were clean and boiled before using.

The application of water as a styptic was of modern origin. In post-partum hemorrhage, for instance, intra-uterine irrigation by hot water was much superior to persulphate of iron, which formerly was much used. Strict cleanliness and hot water at the time of the operation would be the antiseptic of surgery in the future. We were now in a position to appreciate the value of hot vaginal douches introduced by Dr. Emmet in place of zinc solutions, etc., in certain inflammatory processes. While speaking of the value of water employed externally, the author mentioned certain skin-diseases, but pointed out eczema particularly as contraindicating its use. It was also contraindicated in suppurating otitis media, a disease in which much better results had been obtained by substituting the dry boracic-acid dressing. Time had also shown that in normal labor vaginal injections, once commonly practised by some, were contraindicated. The author cited some cases in practice in proof of his deductions.

Passing to the internal use of water for other than diuretic and diaphoretic effects, he first took up its employment in dyspepsia, both recent and chronic, citing cases in which marked benefit had been derived. In recent cases washing the stomach would often bring about a cure in a very short period, while in chronic ones longer time was required, and the remedy had to be supplemented by stricter diet, and perhaps by drugs. The sipping of hot water some time before breakfast was also of benefit in some cases. Washing the stomach had been employed with success in gastric and gastro-intestinal disturbances of infants, and free irrigation of the stomach for ileus was a remedy which should be resorted to before laparotomy. Dr. Baruch could testify to the good effects of irrigation of the intestine in catarrhal jaundice, but this treatment had proved a failure in his hands in jaundice from gall-stones, although others had reported success. In summer diarrhœa it lessened the number and changed the character of the movements, and arrested purging.

Cold water acted on the human body chiefly by mechanical and thermal influence. By its use changes could be wrought in the innervation of different parts, and in the circulatory system to the extent of producing only slight contraction of the blood-vessels or of causing absolute death by shutting off all circulation. The agent was beneficial when applied to the surface in proportion to the reactionary powers of the patient. The application of such briefly-stated principles might be left to each practitioner, but Dr. Baruch mentioned chronic diseases involving faulty nutrition as those in which the external application of cold water afforded much satisfaction, especially in robust patients who

reacted well under drying and friction after the cold bath; and in gastric and cardiac neurasthenia it went far towards restoring the health. The wet sheet involved the presence of a competent assistant, but sometimes promoted reaction better than the bath. In some chronic diseases the applications should be local. As the internal use of hot water had enabled him to dispense largely with such palliative remedies as pepsin, so had the external application of cold water enabled him to dispense largely with so-called tonic medicines. Cold water to reduce the temperature, and to stimulate the nerve-powers to reaction from shock produced by cold upon a large surface, had obtained a wide application, as in hyperpyrexia from sunstroke, rheumatic fever, typhoid fever, etc. The author dwelt upon the greatly lessened mortality in typhoid fever in cases where the temperature was kept down by cold or tepid water, as shown by Brandt's statistics and others. The percentage of deaths in typhoid fever in this country was little better than that recorded in Germany and elsewhere when the application of water to the surface was not practised; it was about twenty-one to twenty-six per cent., whereas under the use of cold or tepid water it had fallen to seven or below. Dr. Baruch had become convinced that the ordinary treatment of typhoid fever should give way to the hydropathic method.

Dr. J. Harvie Drew continued the discussion of this subject in a short paper, impressing its importance more especially from a physiological stand-point. The following facts should first be noted: 1. The chief component part of the human body in health was water; its relative proportion to all the solid constituents had been estimated to be two-thirds or three-fourths the entire weight of the person. 2. Water constituted almost the total volume of each one of the circulating fluids, including that of those of digestion. 3. It was the essential medium by which digestion was accomplished, absorption made possible, and the transportation of the elements of nutrition to the various tissues of the body was made easy. 4. As water entered so largely into the composition of the tissues it became of corresponding importance to every process in assimilation. 5. Water was the medium by which all waste matters were held in solution and conducted to their several points of exit. 6. Observations and experiments had shown that from three to four pints of liquid food were required to maintain normal functions and weight in an individual weighing one hundred and forty to one hundred and fifty pounds. 7. It was a clinical fact that persons thin in flesh were by habit, or for other reason, accustomed to take very small quantities of liquid food, while well-preserved and fleshy persons were copious drinkers of fluid in one form or another. 8. It was also a clinical fact that in every morbid or diseased condition of the system, whether organic or functional, the functions of digestion, absorption, assimilation, secretion, and excretion, embracing elimination, became in some way disturbed,—sometimes one or more of these functions, at others all of them, to a greater or less degree, in the same patient.

It thus became evident that water in its various applications was of extreme importance in the treatment of disease and the restoration of the normal functions of the body. Many physicians objected to the use of water at meals, seeming to forget that it was rapidly absorbed and took the place in the circulatory fluids of the large quantity of water which these gave up during the digestion and absorption of the food in process of consumption. Water or liquid food was seldom taken in excess, but many persons took too little and suffered from deficiency in weight, dyspepsia, constipation, tenacious secretions, dryness and other disturbances of the skin, defective elimination, and all the symptoms brought about in consequence of such disturbances of normal function. The physician should always make careful inquiry as to how much his patients were taking of liquids in one form or another, and he would often be surprised to find that persons who should be eliminating from three to five pints were consuming but one to two pints.

THE TREATMENT OF CHRONIC DYSENTERY BY ENEMATA.

Belleli sums up a series of articles on this subject with the following observations: 1. The symptoms of chronic dysentery do not depend so much on the site and extent of the local lesions as on the effect they produce on the rest of the digestive tract. This is influenced largely by the general state of health of the individual, so that two persons with nearly identical lesions in the colon may have symptoms of varying degrees of severity. 2. In the dysentery of warm climates, the lesions in the colon are often so extensive as necessarily to require a considerable length of time

for their repair. 3. Enemata, when long continued, have grave disadvantages. The daily distension of the colon stimulates the rest of the digestive tract, and causes imperfectly-digested food to be hurried into the large intestine, which it irritates, and so aggravates the disease. And the daily distension of the colon, when long continued, tends to lessen the normal contractility of the coats of the bowel necessary for the performance of its proper functions. Enemata, therefore, are valuable in slight and easily-reparable lesions of the colon; but in the more severe cases other measures must be adopted, such as Carlsbad water, taken on rising in the morning.—*London Medical Recorder*, February 20, 1889.

THE PREVENTION OF SHOCK BY ATROPINE.

Dr. Lewis A. Stimson, president of the New York Surgical Society, at the meeting held January 9, 1889, recommended the hypodermic injection of from $\frac{1}{75}$ to $\frac{1}{100}$ of a grain of atropine previous to giving ether for operation. (*New York Medical Journal*, March 9, 1889.) He referred to two cases of hysterectomies, in one of which the woman had been etherized, so as to admit of a brief examination, a few days before the operation, and had come out of the influence of the anæsthetic in a deplorable condition, from which she had not rallied for several hours. For considerable periods the pulse had been very weak and even imperceptible. On the contrary, atropine having been given before the ether on the day of the operation, she was taken from the table with a pulse as good as before the operation began. The subsequent symptoms of shock had been very slight. He had used atropine for this purpose for five or six years, having first observed its control of the inhibitory action on the heart in certain physiological experiments. How much influence it exerted it was not always easy to determine, but he believed it to be of great value.

We would also call attention to the paper of Dr. Bressler, published in this number of the Gazette for further confirmatory evidence as to the value of atropine in shock.

A NEW TREATMENT OF ANEURISM.

A Glasgow correspondent of the *Lancet*, March 9, 1889, publishes a short account of a demonstration by Dr. Macewen of a new method of treating aneurisms. Needles are passed into the sac in such a way as just to touch the lining of the opposite wall. The oscillation of the needles causes a succession of fine scratches "on the inner surface of the endothelium, irritating it slightly and leading to the proliferation of leucocytes," which develop into a white fibrous mass. It is certainly difficult and probably unsafe to criticise a method of treatment without a knowledge of all the details, which were no doubt forthcoming at the meeting at which the demonstration was made. For example, we do not know if this method has been tried in the human subject, and whether the results have been submitted to careful examination. But, judging from the brief account quoted from, this method does not commend itself to us. We cannot think that it is based on right principles. Of course we need not say that in aneurisms coming under a surgeon's notice there is no endothelial lining of the sac, and that in the majority of cases there is more or less blood clot or laminated fibrin. We can quite imagine that the scratching of the needles might be useful in starting fresh coagulation, and so leading to the consolidation of the aneurism. But it would require enormously strong evidence to prove that proliferating leucocytes could organize into a firm mass of connective tissue amid the tumultuous flow in a large aneurism. And it also seems clear that the layers of laminated fibrin within the true sac of an aneurism are a very serious obstacle to organization of any material within them. Other practical objections to this plan of treatment are the possibility of causing ulceration of the sac or acute inflammation of the surrounding tissues, and also the difficulty of adjusting the needles with sufficient precision.

THE DIAGNOSIS OF TUMORS OF THE CORPORA QUADRIGEMINA.

Up to 1881 only ten cases of tumor of the corpora quadrigemina had been published. Since then, Dr. Nothnagel has met with three cases in his own practice, and in two of them he made correct diagnoses, and published an account of his most recent case in the *Wiener medicinische Blätter*, January 17, 1889. (*The Medical Chronicle*, March, 1889.)

The patient, a boy of fifteen, had a severe fall from a tree more than three years before death. After an interval of time, in which there were no head symptoms, his gait began to be affected. He staggered, walked in a

zigzag path, and frequently tumbled. About half a year after the fall, vomiting and violent cramps and pains were complained of. On admission to the hospital—three years after accident—there was optic atrophy, with complete amaurosis and bilateral external ophthalmoplegia, the left eyeball being almost fixed. The size of the pupils varied, but the reaction was very sluggish. Hearing was affected, probably owing to chronic catarrh of the middle ears. With the exception of the ocular nerves, no other cranial nerves were affected. There was marked ataxia of the cerebellar character, but no loss of power or sensation in the limbs. The clinical diagnosis—tumor of the corpora quadrigemina, with hydrocephalus—was confirmed by the autopsy. The tumor was found to be an epithelial papilloma, springing from the choroid plexus.

The clinical diagnosis of the locality of the tumor was based on the combination of cerebellar ataxia and bilateral external ophthalmoplegia. Great stress is laid on the early onset of ataxia. In all the cases which Nothnagel himself observed, ataxia was the first symptom noticed, and in the majority of cases recorded by others this sign was present. The ataxia is produced by lesions of the posterior pair of the corpora quadrigemina. For it may long precede symptoms of intracranial pressure, due to hydrocephalus. It has been observed in cases in which the middle lobe of the cerebellum was healthy, and Gowers has published a case with no ataxia, in which the anterior pair of corpora were diseased and one of the posterior tubercles slightly affected. It is hardly necessary to add that a reeling gait is not pathognomonic of lesions of the posterior pair of corpora quadrigemina.

Disorders of vision, though they occur in most cases, are of no value for localization, as they may be the result of optic atrophy. One case has been published in which the posterior pair of corpora were diseased without any affection of sight, but the connection between disorders of vision and lesions of the anterior pair is uncertain.

In three of the four cases which Nothnagel has published, the important symptom of bilateral paralysis of ocular muscles was pronounced. One eye was more affected than the other, and the third, fourth, and sixth nerves were all involved. According to Meynert, the nuclei of these nerves are so near the corpora quadrigemina that a vascular tumor of the latter may easily affect all the nuclei of oculo-motor nerves.

The diagnosis based on cerebellar ataxia and bilateral ophthalmoplegia will be strengthened by such symptoms as indicate intracranial pressure, due to hydrocephalus, and the late onset of hemiplegia, and other indications of the extension of the growth, to the peduncles or pons.

IGNIPUNCTURE OF THE TONSILS.

Dr. Wilhelm Roth, of Fluntern, finds that in order to reduce the size of the tonsils without risk of troublesome hemorrhage, which is not uncommon, especially in young subjects, the best plan is to employ ignipuncture, as has been recommended by Krishaber, and more recently by Verneuil. The tonsils and neighboring parts are at first brushed over with a ten to twenty per cent. solution of cocaine. The finest point of the thermocautery, heated to redness, is then inserted to a depth of about five millimetres in three or four spots a few millimetres apart from one another on the tonsils. The instrument is not allowed to remain more than one or two seconds in the tissue. The whole operation, including both tonsils, can be performed in a very few minutes without any bleeding, and with scarcely any pain. It must be repeated four or five times at intervals of two or three days, and this is usually sufficient to cause the tonsils to return to their ordinary condition.—*The Lancet*, February 16, 1889.

THE TREATMENT OF PLEURISY BY THE INHALATION OF COMPRESSED AIR.

Professor Forlanini, of Turin, strongly recommends the above method of treatment chiefly with a view to promoting the expansion of the compressed lung after the fluid has been evacuated. And even in tubercular cases, which, the author considers, form more than half the cases of pleuritic effusion, much good is obtained, for the compressed-air treatment increases the appetite and the sense of well-being, promotes tissue-change, and generally improves the condition of the patient. The difficulty has hitherto been the complexity and costliness of the necessary apparatus, but Professor Forlanini has devised a more simple form. The difficulties in the nature of giddiness, palpitation, ringing in the ears, etc., are simply questions of dose and skill in administration, and are not drawbacks inherent in the system.—*The London Medical Recorder*, February 20, 1889.

SENECIO CANICIDA.

The physiological action of *Senecio canicida*, a composite plant, native of Mexico, and used, as its name implies, to poison dogs, has been investigated by M. DEBIÈRRE. The active principle of the plant is more abundant in the root than in the leaves. Three stages occur in the poisoning arising from its use,—viz., a period of excitation, then one of rest, and lastly of spasm. The temperature rises and remains high until the animal dies, death taking place from paralysis of respiration; the pupil of the eye is dilated, and the blood becomes black and fluid, and the membranes of the brain are found to be congested. While the poison paralyzes the sphincters of the bladder and rectum, it irritates the involuntary muscles of the intestines, bladder, and iris. Although it causes tetanic symptoms like those of strychnine, it differs from that alkaloid in lowering reflex excitability.—*The Pharmaceutical Journal and Transactions*, March 2, 1889.

THE TREATMENT OF SUPPURATIVE DISEASE OF THE UTERINE APPENDAGES.

At the meeting of the New York Academy of Medicine, held January 24, 1889, DR. H J. BOLDT read a paper thus entitled (*New York Medical Journal*, March 9, 1889), in which he endeavored to show that operative interference was positively indicated in certain cases of pyosalpinx about which there was apt to be too much difference of professional opinion as to the treatment called for. He remarked that, while many women had been deprived of their tubes and ovaries without the least benefit, and had had reason to regret having consented to being operated on, there was also a tendency to go to an extreme in the other direction. Cases were not selected with proper care which deserved general instead of operative treatment. Diseases of the uterine annexa might be roughly divided in three groups: 1. Those in which an operation was altogether unjustifiable. 2. Those where the effect of general treatment was to be watched for a time before an operation was considered. 3. Those where delay was not only inadvisable, but dangerous. He wished to present several cases that had occurred in his own practice which had undoubtedly belonged to the third group.

1. A long-standing case of metritis and local peritonitis following confinement, with radiating pains, headache, cardiac palpitation, and dyspnœa; also, within five years previous, syphilitic infection had been superadded. Micturition had been frequent, menstruation very profuse, pains very severe before the flow began, and some leucorrhœa after it had stopped. Examination had shown an indurated cervix tender to the touch, the uterus somewhat enlarged and sensitive, both tubes and ovaries much enlarged and prolapsed, and the surrounding structures very sensitive. A diagnosis of double salpingo-oöphoritis syphilitica with endometritis had been made, and an operation advised unless treatment was soon followed by improvement. A little later a physical exertion had been followed after a few hours by violent pain in the epigastrium, accompanied by a fresh attack of pelvic peritonitis. Five days later general peritonitis had developed, the tubes had lost their full contour, and, instead, a fulness with excessive painfulness had been found on either side of the uterus. Although rupture of the tubes had evidently occurred, he had, unfortunately, not made up his mind to operate till the evening of the next day. The patient had survived the laparotomy only sixty hours; it had been deferred too long.

2. A case of catarrhal salpingitis of long standing in a woman, of 29 years, a sequel to scarlet fever at the thirteenth year. Severe pain had been suddenly developed in the lower part of the abdomen, had increased for a time, then subsided for several days, only to return accompanied by a temperature of 104° F., and a general peritonitis with chills and emaciation. Examination had been exceedingly painful, but had shown fulness and fluctuation to the right of the uterus. Rupture of a tube distended by pus being evident, laparotomy had been performed on the next day, the abdominal cavity had been washed, and dense adhesions removed. The hemorrhage from the latter proving uncontrollable, and the author being forced to cut short the operation owing to the state of the patient, he had tamponed the pelvis with iodoform gauze. This had acted as both a drain and a hæmostatic. Thirty-six hours later he had unwisely replaced the gauze by a double-current rubber drainage-tube, and had washed out the abdominal cavity again through it. If he had closed it at once the patient would probably have recovered. There had been no odor. After some hours the pulse had become very feeble, but had been restored by raising the foot of the bed and irrigating the abdominal cavity with a warm solution of chloride of sodium (one per cent.). On the third day the wound had begun to show an odor, and from

that time on became increasingly fetid, although irrigation had been continued without intermission. The patient had died on the fifth day. The only pathological change found at the autopsy had been diffuse nephritis; the abdomen had been clean and odorless, and the peritonitis decidedly diminished in extent. The foul odor of the washings was inexplicable to him. It was clear, however, that the operation had not been done early enough.

3. In this case a double pyosalpinx and endometritis of puerperal origin had followed a tedious labor eighteen months previously. The distended tube had been ruptured in sexual intercourse. Some vomiting and slight evidences of shock had presented on his arrival at the house. There had been marked tenderness over the entire abdomen, but no evidences of intense general peritonitis. Within two hours he had opened and cleaned the abdomen, removed both tubes, and closed the abdomen without drainage, although peritonitis had begun. Immediate and uninterrupted recovery had followed.

4. In this case, otherwise similar to No. 3, the operation had been done about five hours after the rupture of the greatly distended tubes, and a similar excellent recovery had followed.

5. In this instance, having found double pyosalpinx, he had advised an operation, but another physician had called such a procedure rash, and had assured the patient of improvement without it. Rupture had occurred three months later, an immediate operation had been declined, and death from general purulent peritonitis had quickly followed.

6. In this case he had used massage of the tubes after the method of Brandt, and had obtained marked improvement at once in the symptoms of the pyosalpingitis, which had followed a recent abortion. Nevertheless, six days later, without apparent cause, there had been a severe chill followed by general peritonitis, which, however, had almost subsided four days later. He had been apprehensive of the final result from the first, especially as the tubes had enlarged rapidly as soon as massage had been suspended (on account of the acute pain caused by it). He had brought an aspirator to the house, intending the next day to take the risk of emptying the tubes *per vaginam*. On the evening of the same day, however, rupture had taken place. He had found the patient three-quarters of an hour later screaming with agony, cyanotic, with a high temperature and a feeble, frequent pulse. Forty minims of Magendie's solution had been given, counsel sent for, and preparations made for an operation. An apparently very rapid improvement which the patient had made had created enough doubt in his mind to make him wait for daylight to work by. In two hours she had begun to sink, and when morning had come, despite free stimulation, an operation was out of the question. The temporary rally made by the patient had also deceived an eminent specialist whom he had called in. The case had occurred in private practice. In a hospital or clinic he would not have hesitated a moment. It was unfortunate that in private practice operators were apt to be overborne by side considerations, such as unwillingness to sacrifice a chance of the patient's having children in the future, even when her own life was in imminent peril. The patient in this case had been only 23 years old. An earlier operation would easily have saved her life. He might in the future change his opinion, but with such cases as the foregoing in mind he unhesitatingly advised opening the abdomen in any similar condition, whenever occurring. If the diagnosis proved incorrect, the opening could be closed again, no harm was done, and great risks were avoided.

He believed the diagnosis of pyosalpinx could be made in most instances. It was found unexpectedly at autopsies quite as often as it was mistakenly operated for. Hydrosalpinx and hæmatosalpinx, ovarian and parovarian cysts, could frequently be distinguished by the history. He had believed for several years that patients with intractable hydrosalpinx should be operated on, since the disease easily became purulent; or, if the tube ruptured, might cause fatal peritonitis. He believed in operating in cases of pyosalpinx without waiting for rupture to occur. The danger was then far less. Health was restored entirely, which never could be done while the diseased tubes remained. The patient was taken out of a condition of constant peril and almost constant suffering. The high mortality which a prominent German operator had ascribed to the operation was mainly due to the fact that the operation was deferred until every other means had been exhausted and the condition of the patient was already critical. Furthermore, in case an exploratory incision showed hydrosalpinx or hæmatosalpinx and the tube was firmly occluded at some point, it should not be left in to undermine the health and jeopardize life. The chance of pregnancy in such a case was *nil*, the likelihood of absorption very slight,

and that of return of the fluid after tapping great. Whether the tube was occluded or not could easily be ascertained by observing whether gentle stroking towards its outlet diminished its calibre. When a tube filled with pus could be emptied by gentle pressure he would advise *proper* massage (after Brandt's method), rest in bed, and careful tamponing; but he did not meet with such cases often, and believed them comparatively rare. Also, when a tube was only moderately distended (to about the size of the thumb) and no symptoms were given rise to, he did not favor an operation. Such a collection of pus might in time become inspissated, as occurred elsewhere in the body. But women with such a condition rarely consulted a surgeon or submitted to vaginal examination, even if it was proposed, and that was not likely to be done in the absence of symptoms of local distress. Aspiration of distended tubes was safe only when the operator felt sure of very firm adhesions about the site of the puncture. Some very greatly distended tubes due to puerperal infection gave no signs of their presence other than fever and emaciation. An examination should always be made in such cases, and an operation at once resorted to. It might be necessary to make an exploratory incision to distinguish this condition from the ordinary pelvic abscess in case there were extensive adhesions. It might not be possible without an incision to distinguish it from an ovarian tumor. Massage was a dangerous procedure in any but trained hands. Perhaps its main usefulness was to aid in diagnosis. Despite all he had said, no one was more averse than he to indiscriminate removal of the uterine appendages or more inclined to use every practicable means of saving young women from this (in one sense) degradation.

Dr. Wylie opened the discussion of the two papers by remarking that the reader of the first of them had spoken of tapping pelvic abscesses as if they were themselves a disease, and not a symptom. He thought the aspirator had done more harm than good in this department of gynæcology. "Curing" abscesses in the pelvis by aspiration might relieve symptoms and sepsis, but did not lead to a cure of the patient,—that is, restoration to health,—because that which had caused the abscess remained untouched. Then there were almost always two,—one at least on each side. The most important fact to keep in mind in regard to them was that their frequency was entirely due to mistakes made during and after delivery. They would become less common, moreover, when salpingitis and pyosalpingitis were detected and treated earlier. He believed that, when they were found, no matter where they were situated, it was proper to open them through the abdomen if the condition of the patient allowed, and there was no sepsis. It could be done with a mortality of but one or two per cent. But if the sepsis was marked, then the danger of peritonitis after an operation was great, and we should then see if it was possible to puncture them behind the uterus. If it was, he would advise puncture, washing out, and subsequent operation. If they were out of reach, however, it was better to operate anyhow, not opening over the adhesions, but through a part of the abdomen free from these. A diagnosis could then be made and it could be seen whether an opening *per vaginam* was advisable. He used massage for diagnosis, but would not like to for treatment.

Dr. Paul F. Mundé remarked that pelvic abscess as he used the term was different from pyosalpinx, and meant an abscess in the cellular tissue. Under bimanual examination any abscess in the cellular tissue was freely movable, whereas the uterus was fixed. On the other hand, any intraperitoneal exudation, especially into the tubes, whether palpable or not, allowed the uterus to be lifted up and down more or less. He had frequently verified this test by laparotomies. He did not agree to the statement that the aspirator had done more harm than good. The knife had also done harm. Whenever he was satisfied of the presence of a single pelvic abscess, and could reach it, he aspirated and washed and drained the cavity.

Turning to the second paper, he would say that he entirely agreed with Dr. Boldt about operative treatment. He would, however, remove tubes filled with pus to the size of the thumb. The disease called pachysalpingitis (an increase of the connective tissue), which only Kaltenbach had described, always called for removal of the annexa. As to the diagnosis of pelvic tumors, he agreed that it was not always possible to make it bimanually. A woman who had grown tired of suffering had once forced him to perform laparotomy or leave her to call another surgeon who would. He had found hæmatoma of both ovaries as large as oranges, but with flaccid walls. He would remove the tubes and ovaries in all cases of hæmatosalpinx and hydrosalpinx. He had met with a case where the tubes and ovaries had been removed which

proved to be one of polypoid endometritis which a single scraping might have cured. He did not deny that too much haste was sometimes used in proceeding to operate, and favored a certain amount of temporizing. But he was much dissatisfied with our present ability to make the diagnosis.

Dr. A. P. Dudley had treated two cases of true pelvic abscess by aspiration, and successfully. He thought it a valuable point in diagnosis that the pelvic abscess tended to dissect its way downward between the rectum and vagina, and not to rise into the abdomen. He would not use aspiration for an abscess in front of the uterus; he might for one in the iliac fossa. Pyosalpinx should not be called pelvic abscess, since it led to unnecessary confusion of terms. He thought a woman's station in life should not be allowed to influence the surgeon when her own life was at stake.

Dr. Boldt repeated that massage was suited to some mild cases. Brandt had told him that he had cured pyosalpinx by massage. He himself had never produced more than relief for a time. It was necessary to have the woman in a nearly sitting posture, with the abdominal walls relaxed and thin, and one finger behind the uterus as close to the tube as possible.

HYPODERMIC INJECTIONS OF QUININE IN MALARIA.

Dr. J. A. Correa de Carvalho, of Extremoz (Portugal), has recently recorded a case of malaria, which he succeeded in curing by hypodermic injections of quinine. The patient was a woman, aged 35, in whom the disease had reached the cachectic stage. The skin and mucous membranes were discolored, and the spleen, which was very tender on pressure, reached down to the left iliac fossa, and extended towards the right to within two or three centimetres of the middle line. The stomach was dilated, and the patient suffered much from dyspepsia. The temperature varied from 39.8° C. in the morning to 38.2° in the evening. Sulphate of quinine was given internally in capsules and in pills, but only with the effect of aggravating the gastric disorder. On November 18 hypodermic injections of neutral hydrochlorate of quinine were commenced, at first in doses of 4, and afterwards 5, decigrammes. The temperature soon began to fall even in the morning, and by the middle of December it was normal, never exceeding 37.5° in the evening, and being sometimes below 37° in the morning. On January 13 the patient was discharged cured, the spleen being much reduced in size and not at all tender, and the discoloration of the skin and mucous membranes having almost entirely disappeared. Her dyspepsia had also ceased to trouble her. The injections, which were all made under the skin of the forearm, caused a little irritation. A few small abscesses formed around some of the points of puncture, and had to be opened, but gave no further trouble. The following is the formula of the solution used for injection: ℞ Basic hydrochlorate of quinine, 1 gramme; pure hydrochloric acid, ♏i; distilled water, 2 grammes. These ingredients should be placed in a test-tube, and exposed to the action of gentle heat. A clear solution will be obtained, each cubic centimetre of which will contain five decigrammes of neutral hydrochlorate of quinine. The solution should be injected warm. Dr. A. Rocha first recommended this method, which he had employed successfully in a patient suffering from malaria, to whom it was found impossible to give quinine in any other way. Drs. Beurmann and Villejean had independently described a somewhat similar method a short time before.—*British Medical Journal*, March 16, 1889.

ON THE ACTION OF SOME DIETETIC MEANS AND DRUGS ON THE SECRETION OF PANCREATIC JUICE.

Following the suggestion by Professor J. P. Pavloff, Dr. Polïkarp D. Küvshinsky, house physician to the Alexandrovsky Town Hospital, St. Petersburg, has carried out an important experimental inquiry into the biology of the pancreas in healthy dogs with a permanent pancreatic fistula (established after Pavloff's method). The first group of these highly-interesting researches was devoted to studying the course of the pancreatic secretion under normal conditions. The following main inferences may be drawn from the observations: (1) While presenting certain oscillations in regard to its quantity, the secretion never ceases altogether (the minimal amount observed by the author being 1.4 cub. c.c. (20 gtt.) in half an hour). (2) The functions of the gland are quite distinctly influenced by ingestion of food, mental state, and sleep. (3) A general course of secretion within twenty-four hours after taking food may be sketched thus. Very shortly after the meal the secretion gradually increases, to

reach its primary and highest maximum in the majority of cases nine out of seventeen in about a second half an hour; less frequently six in seventeen during the first one; and only rarely two in seventeen in the course of a second hour. Having attained the maximal level, the secretion usually decreases more or less rapidly (only very seldom keeps at it for an hour or so) and markedly, to rise and sink repeatedly, the re-elevations occurring at about four-hour intervals (*i.e.*, about a first, fifth, ninth, thirteenth, seventeenth, and twenty-first hour after a meal). Bernstein's "secondary maximum" is reached about a twelfth hour. (4) The quantity of the juice secreted, however, presents considerable (both hourly and daily) oscillations, not only in individual animals, but even in the same one in various days, and that in spite of all conditions being as equal as realizable. (5) An average daily (twenty-four hours') quantity of the juice seems to be about 335 cub. c.c. (in a dog of 19 kilogrammes in weight, receiving 300 grammes butcher's meat, 200 bread, and 300 milk a day). (6) The secretion does not cease even in animals deprived of food. Thus, in a dog kept without any food for twenty-four hours, an hourly quantity of the juice, as determined on the next day by the examination every half-hour, was oscillating between 3.4 and 8.8 cub. c.c. A similar statement has been made by Dr. P. Vilijanin, of Professor S. P. Botkin's clinic, in the *Ejenedelnaia Klin. Gazēta*, 1887, p. 309. According to his observations on dogs, even on a third or fourth day of starvation, about .5 cub. c.c. of the juice is still secreted by the pancreas every fifteen or twenty minutes. (7) The secretion is most distinctly increased by mental stimuli, such as excitement or emotion, as the following, yet unique, experiments of Dr. Küvshinsky unmistakably prove. Having starved a dog for twenty-four hours, the author brought it into an excited state by exhibiting its usual meals, by mincing butcher's meat before the animal's very eyes, etc. The secretion, amounting, *e.g.*, to 1.1, or 1.4 cub. c.c. in ten minutes before the experiment in one animal, and to 3.8 in an hour in another, rose by degrees to 5.2 or even 10.1 in (the first) ten minutes respectively, to 29.8 in (the first) hour, to gradually decrease again on quieting the animal by removing the exciting agent from the room, and to increase on a repeated exhibition of the food after a while. The results remained identical in every one of the experiments of the kind. As to the digestive power of the juice, it remains equally energetic, both during the animal's excitement and after its taking food. The "emotional" (*sit venia verbo*) juice, however, contains only 3.5 per cent. of solid constituents, while in that secreted in the course of the first hour after the meal the proportion rises to 7.7 per cent. (8) During sleep the secretion decreases to a very considerable degree. Generally speaking, it commences to sink just on the animal's falling into slumber, to gradually decrease further as its sleep becomes deeper, and to as gradually increase on its awakening. The diminution sets in the more rapidly the more fatigued the animal is (that is, the more rapidly it falls into a deep sleep). (9) Some of the daily oscillations (*sub* 3) are to be ascribed to variations in the animal's state (cheerfulness, mental fatigue, drowsiness, excitement, etc.), some to degree of appetite or fondness of eating in general, of various food articles in particular. The latter fact justifies the corollary that in man, too, a meal taken without appetite is utilized by his organism (at least, as far as the pancreatic functions are concerned) to a far lesser degree than an "appetizing" meal, the cause lying in a scantier secretion of the juice (corresponding to a less vivid "dietetic excitement") in the former case comparatively with the latter. The primary maximum (*vide sub* 3) is probably depending upon (*a*) a more or less intense mental excitement in the very beginning of the meal; (*b*) mechanical stimulation of the duodenal mucous membrane by food ingested; and (*c*) a more or less considerable rise of the intra-abdominal tension (as determined by the food-mass introduced), which presses out an already "stored" juice both from the pancreatic cells and ducts. (10) A quite normal pancreatic juice (in dogs) possesses a very energetic digestive action. (Given 10 cub. c.c. of the juice and 2 decigrm of dried fibrin at 37° to 39° C.; the digestion begins in from five to ten minutes to completely dissolve fibrin in from fifteen to twenty minutes.) Its reaction is always alkaline; its specific gravity 1010 to 1015. On heating, the juice coagulates, giving a clot equal to three-fourths of the juice's volume. The proportion of solid constituents presents marked variations, of which those connected distinctly with taking food may be here noted. Thus, when equal to three per cent. in the first hour after a meal the proportion gradually ascends to six per cent. about a seventh, to fall down to 3.5 per cent. about a tenth, and to reascend to 5.4 per cent. about a twelfth. (11) A normal "secretory tension" in a dog's pancreas amounts to 280 mm. of an aqueous, or

mm. of a mercurial column. That is, the tension is nearly as low as in a rabbit's pancreas (219 to 225 mm. of H_2O). It is highly probable that the pressure is about as insignificant in man too; hence the supposition is fully justified that in human catarrhal jaundice the pancreatic juice ceases to find its way into the bowel, or, at all events, is oozing out of the gland in but very trifling quantities.

The other part of Dr. Küvshinsky's work deals with the influence produced on the pancreatic secretion by alcohol, morphium, and cocaine.

Alcohol (six experiments) was invariably administered internally, on an empty stomach, in the shape of an ordinary (forty per cent.) "table *vodka*" (aquavit.), two tablespoonfuls at a time. The deductions may be condensed thus:

(1) *Vodka* always causes a very marked increase in the pancreatic secretion, which commences about half an hour after the ingestion, lasts for about one and a half hours, and then disappears in the course of a third hour; *e.g.*, in one case, an hourly amount of the juice, equal to 5 cub. c.c. before the experiment, rose to 20.25 cub. c.c. during the first, and to 22.9 cub. c.c. during the second hour after the administration of *vodka*.

(2) The juice excreted under those conditions has relatively low sp. gr. (1010), as well as a low proportion of solids (2.9 per cent.), but all the same it presents a high digestive power (dissolves fibrin in twenty minutes. *Cf. sub* 10.)

(3) Taking into consideration the fact that diluted alcohol gives rise to an increased secretion of the pancreatic juice as well as that of the gastric one and saliva, an internal use of spirits before and during meals is fully justified physiologically, and must be resorted to in cases of anæmia, debility, during convalescence, etc.

Hydrochlorate of Morphium was introduced either under the skin (thirteen experiments) or into the stomach (one experiment), the dose varying from $\frac{1}{12}$ to 1 grain. (1) The alkaloid invariably strikingly inhibits, or even arrests altogether, the pancreatic secretion, and prevents the occurrence of an after-meal increase. (*Vide sub* 3.)

(2) The intensity and duration of the effects are, in rough outlines, going parallel with the size of the doses administered, though any strict proportionality between the two factors cannot be made out. An injection of $\frac{1}{10}$ of a grain produces a pronounced decrease in the secretion already in two minutes, and a complete arrest in half an hour. About the end of an hour the secretion reappears, to gradually return to the normal condition in the course of the next hour. The dose of $\frac{1}{8}$ of a grain inhibits the secretion completely in twenty minutes, the stoppage lasting for one and a half-hours; $\frac{1}{4}$ of a grain arrests the secretion for three hours. As a rule, a complete inhibition of the salivary secretion takes place simultaneously.

Hydrochlorate of Cocaine (eight experiments) was employed hypodermically. (1) Like morphine, the drug develops invariably an inhibitory action on the pancreatic secretion, the effects being fairly pronounced, even after $\frac{1}{12}$ of a grain, though there are observed considerable individual peculiarities in regard to intensity and duration of the phenomenon.

(2) Still, speaking generally, the effects are corresponding to the size of doses administered. A 1-grain dose ($\frac{1}{20}$ of a grain per 1 kilo of the animal's weight) decreases a half-hourly amount of the juice from 13.5 cub. c.c. to 5.8 cub. c.c. during the first half-hour, to 4.6 in the second, the minimum being reached in forty minutes after the injection. A 1½-grain dose reduces the amount of the juice to a half (of that before the injection) in about ten minutes, and completely inhibits the secretion (for two minutes) in fourteen minutes. The effects, however, last for a far shorter period than in the case of morphine.—VALERIUS IDELSON, *The Medical Chronicle*, March, 1889.

OBSERVATIONS ON INTESTINAL SURGERY.

At the meeting of the Royal Medical and Chirurgical Society, held March 12, 1889, MR. F. BOWREMAN JESSETT communicated a paper on the results obtained from experiments made as to a new method of operating on the intestine (*Lancet*, March 16, 1889). Certain operations on dogs had been conducted by Mr. Victor Horsley and himself, assisted by Dr. Dove. The operations performed were the following: 1. Gastro-enterostomy and jejuno-ileostomy by the method: Two plates of decalcified bone were prepared, each having a central oval opening and four perforations for sutures near the margin of that opening; sutures were passed through these perforations and fastened at the back. The operation was accomplished by making a longitudinal opening in the stomach and a corresponding opening in the jejunum as

high as possible; a bone plate was slipped into each viscus, and the threads passed through all the coats of the stomach on the one hand and the jejunum on the other; the corresponding threads of either plate were then tied firmly, the knots being imbedded between the peritoneal surface of the intestine and stomach; the parts were then dropped back into the abdomen and the parietal wound closed. Jejuno-ileostomy and ileo-ileostomy were performed in identically the same way. The operation could be easily accomplished in from fifteen to twenty minutes. 2. Circular enterorrhaphy, as in cases of intestinal wounds, malignant disease, typhoid ulcer, or in any case in which it was deemed advisable to remove a portion of the intestine. The following method was adopted: The portion of the intestine being removed, a narrow band of india-rubber was cut the exact size of the circumference of the upper portion of the divided gut; this was formed into a ring by two catgut sutures. This ring was next pushed into the gut and fastened round its free edge by a continuous catgut suture. Two threads, armed at either end with a common sewing-needle, were prepared. One thread was passed through the upper end of the india-rubber ring, now fixed in the intestine, and all the coats of the bowel, the needles being passed one on either side of the mesentery. The needles of the other thread were passed equidistant through the rubber ring and the coats of the intestine on the convex surface. The needles were next passed through the serous and muscular coats of the lower portion of the bowel, about an eighth of an inch from its cut edge, at corresponding points. These threads were drawn tightly, and the upper portion of intestine invaginated into the lower, so that the two peritoneal surfaces were in close contact, and the threads were then tied sufficiently firmly to prevent disinvagination. The bowel was dropped into the abdomen and the wound closed. 3. Ileo-colostomy, an operation especially applicable in cases of tumor or cancer of the colon or intussusception of the ileum into the cæcum and colon, was performed by lining the upper divided end of the intestine with an india-rubber band, in the same manner as described for circular enterorrhaphy. An incision was then made in the convex surface of the colon, and the threads passed through its muscular and serous coats. The threads were then drawn tightly, the small intestine slipped into the slit in the colon, and the threads tied sufficiently firmly to secure the parts in apposition. The distal portion of the divided intestine was invaginated into itself and fixed by a continuous suture passing through the serous and muscular coats only. This operation might also be performed by means of approximation decalcified bone disks. These operations Mr. Jessett had performed on dogs with the following results, viz.: Two cases of gastro-enterostomy with approximation disks; both recovered without bad symptoms. Five cases of jejuno-ileostomy with approximation disks; all recovered. One case of jejuno-ileostomy by implantation; died of secondary hemorrhage. Seven cases of enterorrhaphy by invagination; four recovered: the two first cases died directly from the operation, and one from obstruction caused by an enterolith. Three cases of ileo-colostomy by implantation; all recovered. To sum up, the results of operations performed by Dr. Senn and himself would be found to be as follows: Gastro-enterostomy: six cases; one death (mortality 16.6 per cent.). Jejuno-ileostomy by approximation disks: thirteen cases; one death (7.69 per cent.). Jejuno-ileostomy by the Czerny-Lembert suture: seven cases; five deaths (71.5 per cent.). Enterorrhaphy by invagination without omental flap: four cases; three deaths (75.6 per cent.). Enterorrhaphy by invagination with omental flap: twelve cases; three deaths (24.99 per cent.). Ileo-colostomy by implantation: nine cases; two deaths (22.2 per cent.). Ileo-colostomy by lateral apposition and Czerny-Lembert suture: seven cases; two deaths (28.6 per cent.). Ileo-colostomy by apposition with approximation disks: three cases; one death (thirty-three per cent.). By comparing these figures with those collected by Dr. Farquhar Curtis, himself, and others, it was found that the operation, as at present practised with the Czerny-Lembert method, showed a mortality of 86.6 per cent. as against 24.99 per cent. in those cases of enterorrhaphy performed by Senn's method of invagination, and 7.69 per cent. of those performed by means of approximation disks. The advantages claimed for this method of operating were simplicity, expedition, and better results. Simplicity: Mr. Jessett used only from four to six sutures, whereas by the Czerny-Lembert method fifty or sixty sutures were required. Expedition: He could perform the operation in about twenty minutes, whereas the present mode of operating required quite an hour and a half. Better results: He showed a mortality of 7.69 p cent. by Senn's method of approximat

disks, whereas of the operation by the Czerny-Lembert suture, performed under the same circumstances by the same operator on similar animals, the mortality was 75.6 per cent., or ten times as great.

AGARIC ACID.

Agaric acid is the subject of an experimental essay recently published by Professor HOFMEISTER, and analyzed by DR. BURGESS in the *Medical Chronicle* for March, 1889.

PURE agaric acid is a bibasic, triatomic homologue, of the malic acid series, having the formula $C_{14}H_{27}(OH)<^{CO\ OH}_{CO\ OH}$. Its solubility is but slight in cold, and fair in boiling water. The neutral alkaline salts dissolve readily, and, like the salts of the higher fatty acids, easily break up in solution into free acid and basic salt.

Locally its action is that of an irritant. Injected under the skin it causes intense pain, inflammation, and suppuration. When swallowed, large doses produce vomiting and diarrhœa.

The general action on cold-blooded animals is a gradually progressive central paralysis, weakening of the heart, and suppression, or marked depression, of the cutaneous secretion.

The only symptoms produced in dogs by large doses administered by the mouth were vomiting and diarrhœa. By subcutaneous and intravenous injections in rabbits, it was found that the vaso-motor and vagus centres were first stimulated and finally paralyzed. Death was caused by failure of respiration, and in animals subjected to artificial respiration, by failure of the heart.

The action of agaric acid on the secretion of sweat was investigated in cats by injecting subcutaneously the soda salt. The results placed beyond a doubt the anti-hydrotic action of the drug. The facts that in an animal under the influence of agaric acid, irritation of the sub-sciatic nerve had no effect on the secretion of sweat in the corresponding leg, and that this limb sweated profusely some minutes after the injection of pilocarpine, prove that the action is not central but peripheral.

With the exception of the anti-hydrotic effect, there is no similarity between the actions of atropine and agaric acid.

Malic acid and other members of higher fatty acid series were tried, and found to have no influence on the sweat-glands.

In regard to the therapeutic use of agaric acid, it is to be noted that the local irritation produced by the drug and its salts forbid the subcutaneous administrations. On the other hand, vomiting and diarrhœa need not be so dreaded when the pure drug is used as the experience of those who have tried the commercial agaricine might lead us to do.

Doses of 0.05, and in one case 0.1, given to phthisical patients caused slight temporary nausea and signs of intoxication. Doses of 0.02 and 0.03 were, without exception, well borne. The anhydrotic effect became first manifest hours after the drug was taken, and lasted for over twenty-four hours. Hence it is possible to get the full benefit of a large dose, and at the same time avoid the unpleasant effects, by repeating small doses at short intervals.

The large doses should not be ventured on unless it is quite certain that we are dealing with pure, white, well-crystallized agaric acid, which does not taste bitter when dissolved in weak alcohol, and forms a colorless solution in boiling water.

THE CHEMISTRY AND PHARMACOLOGY OF THE ORGANIC NITRITES.

A more complete pharmacological investigation of the organic nitrites would, without doubt, furnish therapeutics with results of the highest importance. Although two preparations are at present official that are supposed to depend for their therapeutic value upon the presence of such compounds,—the spiritis ætheris nitrosi, B. P., and amyl nitris, B. P.,—considerable obscurity exists as to their mode of action, consequent upon the want of uniformity in the results obtained by their use. Both preparations are, in fact, known to be more or less varying mixtures of the characteristic nitrites with other bodies, and it must be evident that exact conclusions as to the physiological action of their respective constituents cannot be arrived at until these have been separated in a chemically pure state and made the subject of careful experiment. The chemical portion of this work has been commenced in the newly-established research laboratory of the Pharmaceutical Society, and a few months since the director, Professor Dunstan, in conjunction with Mr. Dymond, described a convenient process for the preparation of pure ethyl nitrite, and of a fairly stable solution of the same. A comparison of the action of this pure solution of ethyl nitrite with that of the heterogeneous

solution known as spiritus ætheris nitrosi was undertaken by PROFESSOR LEECH, of Manchester, who reported his results to the Pharmaceutical Society at the evening meeting on Thursday, December 13. He stated that he had found no evidence that the two preparations differ at all in their therapeutic effects, provided the doses given contain an equivalent amount of ethyl nitrite; and it did not appear that the other constituents of spirit of nitrous ether have any therapeutic importance. Professor Leech is, therefore, of opinion that, since a fairly stable solution of pure ethyl nitrite is now available, the formula for its preparation should be included in the Pharmacopœia, and that the time-honored spiritus ætheris nitrosi should disappear from the list of official remedies. "Amyl nitris, B. P.," is at present the subject of a similar investigation, and some of the results were reported on the same occasion. Although the physiological experiments have not yet been completed, enough is known to warrant saying that they will probably affect the future of this preparation as an official remedy. The amyl nitrite of the Pharmacopœia is prepared by the action of "nitric or nitrous acid on amylic alcohol, which volatilizes between 262° and 270° F." As the fraction distilling between these limits of temperature might contain constituents of the crude fusel oil used other than pure amylic alcohol, and these would also be acted upon by the acid, there are evidently the conditions present for an admixture of other nitrites. Moreover, if nitric acid were used there would also be a formation of oxidation products. In fact, previous workers had reported the presence, besides unaltered amylic alcohol, of valeric aldehyde, valeric acid, and amyl valerate. Professor Dunstan and his co-workers, Messrs. Woolley and Williams, have also recognized in good commercial samples of "amyl nitrite" the presence of isobutyl nitrite, α-amyl nitrite, and β-amyl nitrite, and in an inferior sample there were also propyl nitrite and ethyl nitrite present. It was, therefore, determined to prepare specimens of these nitrites in a pure state and hand them over to competent workers for comparative experiments as to their physiological action. Pure isobutyl nitrite was prepared and a comparison of its action with that of α- and β-amyl nitrites was undertaken by Professor Cash, of Aberdeen. This investigation is still in progress; but, so far as it has gone at present, the results point to the unexpected conclusion that the isobutyl nitrite is the most active constituent of the official "amyl nitris," or, at any rate, that it is more prompt in its action on the blood-pressure, pulse-rate, and respiration in small animals than a mixture of the two amyl nitrites. The probability of this conclusion is also confirmed by some results obtained by Dr. Lauder Brunton, who, in comparing the action of amyl nitris, B. P., with that of a mixture of the amyl nitrites, found that the official preparation, which would have contained some isobutyl nitrite, produced the more marked effect on the human pulse-rate. It is evident that this combination of chemical with physiological research is full of promise for the future. Speaking on behalf of physiologists, Professor Michael Foster recognized the service that chemists might render by supplying them with "clean" drugs for their investigations. Just as it is known that the presence of a minute quantity of one metal in a very large quantity of another will affect the properties of the whole mass, so, he pointed out, the presence of even small impurities in a drug might vitiate all the results obtained from its use. Professor Burdon Sanderson also testified to the importance of this line of work, and expressed the hope that the research laboratory now established for the chemical side of pharmacological investigation by the Pharmaceutical Society might soon have its complement in a physiological laboratory established under the auspices of the great medical corporators.—*British Medical Journal*, December 22, 1888.

NUTMEG-POISONING.

Poisoning from nutmegs, or from their volatile oil, occurs more frequently than is thought, as the drug is credited by many women with arbortifacient properties. In the *Philadelphia Medical Times* for March 15, 1889, DR. WM. F. WAUGH reports the case of a married woman, who, suffering from dyspepsia, on the advice of a neighbor, ate five medium-sized nutmegs. No unpleasant sensations were experienced until half-past eight of the same day, when she became nauseated, giddy, and had a chill, accompanied by vomiting, headache, dryness of the mouth and throat, and a sore, strained sensation in the eyes. Her sight was somewhat affected, as she complained that everything appeared misty. When the chill passed off, slight fever and sweating followed, with intens throbbing headache. There was at no time

any disposition to sleep. The next day the nausea had subsided; the pupils were unaffected; the pulse full and regular; but the headache continued, and it was a week before all the symptoms had disappeared. There was not at any time danger to the circulation or respiration. The report of this case, it is noticed, offers symptoms which are contradictions to the general idea as to the action of this drug. In the last edition of the U. S. Dispensatory nutmeg is credited with considerable narcotic power, while in the *American Journal of Pharmacy*, 1885, one and one-half nutmegs are stated to have caused in a woman stupor, followed by excitement, with evidences of collapse. Dr. H. C. Wood concluded from his experiments upon the lower animals that the oil of nutmeg is a powerful narcotic, with very much less sedative influence upon the heart than is possessed by most volatile oils. In the dog, he found that it caused profound sleep, with slowed respiration, and, in large doses, abolition of reflex activity.

THE PHYSIOLOGICAL EFFECTS OF ANTIPYRIN.

Messrs. Crolas and Hugounenq report in the *Lyon Médical* for March 3, 1889, a series of experiments made to determine the physiological effects of antipyrin, their research being directed towards the determination of the influence of antipyrin on the number of red corpuscles; on the variations in volume of the urine, urea, and the actual amount of phosphoric acid, and on determining the toxic dose of antipyrin. These experiments seem to warrant the conclusion that in the normal state of the dog, doses of from 45 to 150 grains of antipyrin, continued during forty days, do not appear to sensibly diminish the number of the blood corpuscles, while spectroscopic examination in no case revealed the presence of methæmoglobin in the blood.

Their experiments under the second heading seem to indicate that antipyrin does not diminish the quantity of urine excreted in twenty-four hours, while their experiments as to the influence of antipyrin on the urea are not thoroughly concordant. It would seem that the urea, so far from diminishing under the influence of antipyrin, is actually increased. Phosphoric acid, which might be regarded as measuring the intensity of phenomena of denutrition, does not appear to be subject to notable variations, a fact which would seem worthy of attracting the attention of clinicians.

As regards the toxicity of antipyrin, their experiments seem to show that doses of from 75 to 150 grains of antipyrin may be given for fifty-two days at a time without producing any symptoms of poisoning. In attempting to determine the toxic dose, the authors gave at one time 150 grains, at another 300 grains, —a quantity corresponding to 1800 grains for a man,—and yet no marked effects were observed.

THE ACTION OF PARALDEHYDE.

In the *British Medical Journal*, March 9, 1889, Dr. John Gordon published an elaborate experimental investigation of the action of paraldehyde, of which the following is a summary: 1. Paraldehyde caused an increase in the excretion of urea. 2. It did not in any marked way affect the quantities of chlorides excreted. 3. It did not invariably increase the excretion of the fluid constituents of urine, but in the majority of cases which I have recorded it diminished them. 4. The odor of paraldehyde, when given in large doses, was found in the urine, showing that some of it probably passed unchanged through the system. 5. After the full dose of the drug the respirations were slowed, and rendered tranquil and steady. 6. It had no appreciable effect on temperature. 7. In cases of average health without sleeplessness it did not have any hypnotic influence except in large doses. 8. It caused no loss of appetite. 9. There was sometimes a tendency to perspiration under its influence, which atropine controlled. 10. The blood-pressure was only slightly reduced by the smaller doses, the large dose reducing it more, but only after distinct slowing of the respiration. 11. The pulse was slowed. 12. It diminished the reflex excitability of the spinal cord. 13. It had a peripheral influence in controlling sensation. 14. It speedily diminished, and in large doses destroyed, the irritability of motor nerves. 15. Equal doses diminished the excitability of motor nerves sooner than that of muscle. 16. Small doses first slightly excited and then diminished the excitability of muscle-substance. 17. Large doses speedily destroyed (temporarily) the irritability of muscle-substance. 18. There was a tendency to complete recovery in the muscle after a small dose, but seldom complete recovery after a large dose. 19. Curarized muscle showed increased excitability over non-curarized mus-

cle when treated with an equal dose of paraldehyde and equally stimulated.

The advantages of the drug as a hypnotic, to which group it distinctly belongs, depend on the following points: 1. It is not a cardiac depressant. 2. It has no marked period of toleration, since in some cases of insomnia from overwork the drug has been taken in the same dose for some months with equally good hypnotic results. 3. No marked craving for the drug seems to be induced by its use. 4. It does not exercise, except in large doses, a hypnotic effect on a person not suffering from sleeplessness; hence there is no probability of its abuse. 5. It has not a marked period of excitement before the hypnotic action takes place. 6. Its action is speedy, patients generally falling asleep within ten minutes after its administration. 7. The patients may be aroused while under its influence without any disagreeable or confused sensation. 8. The sleep which it produces is tranquil and quiet, with diminished respirations; this slowing of the respirations in many pulmonary diseases is of distinct advantage. 9. It is not liable to disorder the digestion. 10. In many cases it is gently laxative in its action.

From the experiments which were performed on the lower animals its use as a narcotic in cases of insomnia with slight pain is not contraindicated, since the author's experiments with frogs show that it controls to some extent the sensory nerves; and the experiments with cats prove that, in large but non-poisonous doses, it exercises a narcotic influence. And it is possible that, since a large amount of the drug is excreted by the lungs, its vapor may exercise a narcotic influence on the terminations of the sensory nerves of the lung-tissue while it is being expired.

Dr. Gordon's method of prescribing is in doses of from 40 to 60 minims for adults, well diluted with cinnamon water, adding a little sirup of tolu and compound tincture of cardamoms.

INTRAOCULAR WASHING AFTER THE EXTRACTION OF CATARACT.

M. MUGNIÉRY gives the following *résumé* of his graduation thesis, basing his results on the observations noted in the practice of Professor Gayet in Lyons (*Lyons Médical*, March 3, 1889). Lavage has been practised under five different indications: First, to prevent hypopyon. Second, to free the anterior chamber from collections of blood. Third, as an antiseptic. Fourth, to carry away the cortical mass during the operation of the cataract. Fifth, to produce by the regular contraction of the iris an exact coaptation of the wound.

For the employment of this mode of treatment, aseptic liquids are to be preferred to antiseptic liquids as less liable to reduce the vitality of the tissues. Two methods of practising this procedure may be employed: the one consists in thrusting the canula into the anterior chamber, through the corneal wound. This method, however, is regarded by the author to be not as efficacious as the other, in which the canula is not introduced into the eye, and is therefore less dangerous, both from the point of view of antiseptics and as less liable to produce traumatism. This method of treatment is claimed by the author to be especially advantageous in the after-treatment of operations for cataracts, as by it the pupil is freed, the whole operation is disinfected, and the use of instruments and the instillation of atropine are avoided. Increase of ocular tension and issue of the vitreous humor are the only contraindications to this treatment.

Reviews.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS. Consisting of original treatises and of complete reproductions in English of books and monographs selected from the latest literature of foreign countries, with all illustrations, etc. Published monthly. Vol. I., No. 2, February, 1889.
New York: William Wood & Co.

The publishers of this series are introducing to the American profession a remarkably good series of monographs. The three comprised in the present volume deserve more than a hasty reading. Every page is replete with valuable matter, and repays study. The article on "Gonorrhœal Infection in Women," by William Jap Sinclair, A.M., M.D., is not only a *résumé* of the recent publications on this subject, but contains much original matter derived from the author's own experience and experiment. This subject has only of recent years—and very recent—become one of vast importance, if one is to believe the observations of gynæcological operators. The author, Dr. Sinclair, is disposed to follow the footsteps of Dr. Noeggerath almost everywhere they lead: at one or two points he stops short, and at these points Dr. Noeggerath himself seems to have modified the positive statements of his earlier publications. Be this as it may, Dr. Sinclair regards the

early observations and views of Dr. Noeggerath as almost an inspiration in considering that at that time the gonococcus of Neisser had not been discovered, nor as yet the immense mass of observation collected by operators in this field. Indeed, matters have gone so far that any married man whose wife is of feeble health stands a good chance, if the gynæcologist is called in, of being held up as the author of her woes; and, while the exaggerated view that gonorrhœa in the male is never or almost never cured has had to be abandoned for the present, the like view in regard to the disease when it has once fastened upon the female sex is firmly held by the author and many others. So that now the male victim of this disorder has not so much to fear resulting stricture of the urethra as the resulting strictures of another character, affecting his reputation and domestic peace and happiness. The author, however, gives us very definite directions as to how the invasion of the pelvic organs in women may be averted, and many practical points in the treatment of gonorrhœa which will be found of great use.

Gonorrhœal puerperal fever is extensively discussed, and we feel sure that many readers will find this part of the work new and interesting: and that the author will be found to explain some mysterious cases of the kind, the memory of which will have remained in the practitioner's mind to annoy and perplex him, making him doubt either the value of antisepsis in midwifery or his own ability to apply it properly.

A very interesting chapter is that on the method of testing secretions to discover the gonococcus, after reading which one cannot but feel that some doubt may yet remain in regard to many reported observations and finds, when the extreme difficulty of detection is revealed. While one observer (Bumm) "has proved the existence of micro-organisms which cannot be distinguished by individual form alone from Neisser's gonococcus,"—describing five different varieties thus indistinguishable,—Dr. Gabriel Roux, by the use of Gram's staining-fluid, arrives at this result, that by it he "fixes the color in all micro-organisms as far as is known at present, excepting the gonococcus." Thus we see that even this evidence is negative, since there may exist other micro-organisms as yet unknown which also may disappear and refuse this staining process. One such organism hitherto unknown, but having its habitat in the vagina, gland of Bartholini, cervix uteri, or tubes, if it chance to behave in the presence of the staining-fluid in a similar manner, would vitiate all results hitherto obtained, unless there were other perfectly reliable evidence connecting the examined secretion of one sex with coexisting similar disease in the other,—and in that case the gonococcus can be ignored any way. But besides this portion of the work, the remaining chapters are of great value from a practical stand-point, and we believe the monograph, as a whole, to be perhaps the best summary of the recent advances of true scientific knowledge on the subject to which the reader can gain access.

The second of the three monographs comprised in this volume is "On Giddiness," by Thomas Grainger Stewart, M.D., and discusses its subject in all its varieties. The author defines giddiness as "arising from external conditions;" from "changes in the sensory structures;" from "changes in the conducting fibres in the central nervous system;" from "dyspepsia;" from "toxic causes;" from "causes of uncertain seat;" from "peripheral irritation;" from "mental causes;" and discusses each variety at length, giving a very interesting and clear chapter on Menière's disease and its varieties.

The last article is "A Critical Study of the Clinical Value of Albuminuria in Bright's Disease," by Dr. Pierre Jeanton, Paris. This is a very exhaustive study of the subject, in which the author devotes much space to the consideration of tests and their value, and will prove of great service to those awake to the great importance of the subject.

E. W. W.

HANDBOOK OF HISTORICAL AND GEOGRAPHICAL PHTHISIOLOGY WITH SPECIAL REFERENCE TO THE DISTRIBUTION OF CONSUMPTION IN THE UNITED STATES. Compiled and Arranged by Geo. A. Evans, M.D., etc.

New York: D. Appleton & Co., 1888.

The author's short historical sketch is excellently done for the brief space it occupies. This is followed by the real work of the book,—viz., the geographical distribution of phthisis. Here the author is a compiler of statistics; in fact, he claims to be nothing more. But the reader will find a vast amount of useful information in his pages other than mere figures, averages, and percentages. From the "Handbook of Geographical and Historical Pathology" of Hirsch he obtains his statistics concerning the death-rate of pulmonary phthisis in countries other than the United States. To these he has added much valuable matter

bearing upon the climatology, etc., of foreign countries. "A remarkable fact," he says, "is its rarity in many of the islands and coast districts within the more northern latitudes, such as Iceland, the Faroe Islands, the Hebrides, and Shetland Islands, and places in Norway." This point he pursues still further, and with reason, since this is the age of travel, and the consumptive, if pecuniarily able, is exiled as soon as possible, sent to some noted resort selected from the accessible places where consumption is unknown or rare. Some of the best places are beyond reach. Iceland, for instance, holds out no inducements to counterbalance the awful depression of its climate and cold. The steppes of Asia, where it is said to be unknown, are too remote, and too real an exile. Better death to most than such a life. Of Switzerland he says, "Few countries of Europe enjoy, on the whole, so favorable conditions. Contrary to general belief, phthisis is "prevalent to a very great extent on the central plateau of Spain, as well as in the larger parts of Barcelona, Valencia, Cadiz, Gibraltar, and Lisbon. According to the author's collected statistics, Italy in its northern regions is unfavorable too, but in its southern a good resort for the consumptive. In fact, a cursory glance at the author's tables impresses one with the view that the most excellent places of the earth for the phthisical sufferer are generally the most remote and inaccessible. Then, too, statistics are in this instance peculiarly unreliable, and are by no means constant. Since the healthy resort of a score of years ago may be now filled with tuberculous taint brought to it by those seeking a prolongation of life, recent years, therefore, have in many instances modified for the worse the early favorable statistics of many places, as, for instance, Australia. But to turn to this western world. While Iceland, as stated above, is almost exempt, North Greenland tables show it to be one of the commonest causes of death. At trading stations on Hudson's Bay "phthisis is prevalent among the scanty population to an enormous extent." The same is true of the Aleutian Islands and Alaska. Mexico in its highlands is still, according to the author, a good place for a future sanitarium, while the West Indies afford scarcely any immunity. The author then examines the United States, and we feel sure that a knowledge of his facts will upset many preconceived opinions, and in addition to this a study of the book will enable the physician to select for his phthisical patients places equally good with distant resorts, but much nearer and more accessible,—a *very* desirable thing in these days, when fashion, ruling as in other fields, is too apt to banish the sick to certain well-known and already crowded resorts. E. W. W.

A HANDBOOK OF THERAPEUTICS. By Sidney Ringer, M.D., etc. Twelfth edition.
New York: William Wood & Co., 1889.

To arrive in a few years at a twelfth edition a book nowadays must possess intrinsic value. So many new competitors drive off the field all old books, to seek a hiding-place in unused corners and dusty shelves. The secret of Dr. Ringer's success lies in the fact that he attacks his problem from a different point from that usually occupied by the therapeutist, and from a point which seems more practical to the average reader, who is nine times in ten a hard-worked practitioner, by no means scientific, but always seeking something to benefit the cases in hand. He "dwells much more on the indications for the use of drugs in disease than on their physiological action;" and alas! for human nature, he appeals to more readers than the scientific therapeutist from his higher stand-point. In fact, the author's introduction may be called a pæan in praise of symptomatic treatment, for he argues in its favor; in fact, he claims it as a necessity. "Of late years, since attention has been more drawn to the significance of physical signs, too little heed seems to me to be paid to the detection and appreciation of symptoms, objective and subjective." "Physical signs are soon learned, while it requires a longer time, more patience, and a more discriminating observation to appreciate the meaning and to estimate the value of symptoms." "Important though physical signs undoubtedly are, yet symptoms, especially objective symptoms, are far more valuable." "Physical signs, as a rule, help us to detect only coarse and decided changes, and are chiefly useful in diagnosis, while symptoms are far more useful guides in prognosis and in treatment." And still further he says, "When we have accurately diagnosed the disease, we treat, in most cases, the secondary effects, . . . and these effects generally make themselves apparent solely as symptoms." We have quoted thus from the author's own words that our readers may understand the exact status of the author in the matter. In this edition we miss the mention of some drugs much noticed in previous editions, and mark the introduction of many new ones, concerning which the medical world is yet uncertain and eager to hea

additional argument. Throughout the book there is a delightful mingling of clinical instruction and empirical hints, with the real discussion of the action of the remedies under consideration. However one may agree or dissent from the author, one is sure to derive some instruction,—to find out something new or suggestive from his pages; in fact, "Ringer's Therapeutics" fills a gap between the scientific therapeutics of to-day and the totally empirical therapeutics of the yesterday of medicine. E. W. W.

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New York: Wm. Wood & Co., January, 1889.

The first of the "original treatises and of complete reproductions in English of books and monographs selected from the latest literature of foreign countries, with all illustrations, etc.," is before us, and bids fair to prove the best, so far as one can judge from the first two volumes of the monthly publications of the firm from which it issues. The January volume contains three monographs,—"The Pedigree of Diseases," by Jonathan Hutchinson, F.R.S.; "Common diseases of the Skin," by Robt. M. Senion, M.D.; "Varieties and Treatment of Bronchitis," by Dr. Ferraud.

"The Pedigree of Disease" is as attractive as its title; it is one of those articles—seldom seen—often longed for, which show how much may be accomplished by a polished writer of large experience and wide range of thought when he turns his attention to some general medical topic. To write such an article a man must be far more than a mere specialist or a mere routine practitioner of even the most extensive practice; he must be a man of thought with highly cultivated powers of reasoning and observation. And the article, when written and read and remembered, will always prove its value by lifting the true reader to the author's higher plane, and giving him a view of every-day objects so varied and so novel that he scarcely recognizes them. The author discusses idiosyncrasy, temperaments, congenital peculiarities, diathesis, and all the many points that his subject brings up, enforcing them with illustrations drawn from the most extensive observation and tenacious memory; and while we cannot quote from his pages or portray his arguments or conclusions, the reader will, we are sure, thoroughly appreciate his work when once he begins its perusal.

"Common Diseases of the Skin" is a plain, practical treatise, wherein the author strives as much as possible to simplify the sub-divisions of the dermatologist, and instruct the unskilled and unspecial in the art of cure. We know no simpler and more useful manual for the treatment of "common diseases of the skin;" as for the uncommon ones, the few that the author leaves in this class we can cheerfully surrender to the specialist the more readily, since they are apt to be incurable.

"Clinical Lectures on Bronchitis" is principally devoted to a discussion of what the author terms "congestive bronchitis," which he differentiates "from both catarrh and inflammation;" he divides it into many varieties and goes minutely into its treatment.

"Catarrhal Bronchitis and Inflammatory Bronchitis," with the treatment of each variety, form the balance of the book, which abounds with formulæ, some of which are apparently novel to the American reader, and we should judge of much value, and, in short, the three articles in this volume certainly form a valuable addition to practical medical literature.
E. W. W.

HANDBOOK OF SKIN-DISEASES. By Arthur Van Harlingen, M.D., Professor of Skin-Diseases in the Philadelphia Polyclinic, Clinical Lecturer on Dermatology in the Jefferson Medical College. Second edition. Revised and enlarged. Small 8vo, pp 410.
Philadelphia: P. Blakiston, Son & Co., 1889.

The second edition of Dr. Van Harlingen's handbook contains almost double the amount of matter presented in the first publication. This increase has been chiefly in the matter of diagnosis and treatment, especially the former. The subject of therapeutics was fully and intelligently discussed in the first edition, and the changes made consist, in the main, in the incorporation of the advances made in this branch in the past few years. It was this department of the subject, in fact, that won for the book, and deservedly, such favorable recognition, presenting, as it did, clear and concise directions for the management of the different diseases, and given in a manner that the general physician must have found a pleasant change from the bewildering discursiveness of similar and many larger works. This claim to recognition, so pronounced in the first edition, has been even strengthened in the second. The author has, moreover, in this revision and enlargement, evidently had in view the simplification of the differential diagnosis, and, in endeavoring to bring this part of the subject

up to the plane of the therapeutic portion, has succeeded in producing an excellent and well-balanced handbook. The busy practitioner will find it a thoroughly safe and practical guide in the recognition and treatment of this troublesome class of diseases.

Correspondence.

PARIS.

(From our Special Correspondent.)

Large Doses of Sulphonal needed in France— Saccharin Good as a Medicine, but Bad as a Food—Its Use as a Mild Caustic for Thrush—The Walking Mania, a Form of Epilepsy—The Resorcin Spray in Diphtheria—Better Off without a Diploma.

Experiments with sulphonal, the much-controverted hypnotic, still continue, and although the subject is far from exhausted, the discussion has brought out many facts important for a correct estimation of the new remedy's value. A recent addition to this branch of therapeutics has been contributed by Dr. Mairet, a professor at the Montpellier Faculty, in collaboration with Dr. Salvetat, a graduate of the same college. Not to repeat what has been already said respecting the chemical properties of sulphonal, its unfortunate insolubility, and its physiological effects on animals and some patients, recorded by various German investigators, the following were the results observed by Dr. Salvetat, on experimenting on himself and some of his friends. Doses, varying from 1 to 2 grammes (15 to 30 grains), never afforded hypnotic effects; 3 grammes caused in some subjects slight drowsiness, in others nothing whatever. It required 4 grammes (1 drachm) to affect Dr. Salvetat, and rather unpleasantly too. The dose was taken at 5 P.M.; at 9 a feeling of inebriety overtook him, and at 9.30 sleep, which lasted until 8 next morning, when he was awakened by a servant; half an hour later he slept for two hours more. At 11.15 he had no appetite for breakfast, and felt like vomiting; in the afternoon he took another nap of about half an hour, and was still dizzy and tired, but well otherwise, and ate a hearty dinner, after which he slept all night as usual. The chief difference between German and French experimenters is in respect to the dose. While Drs. Kast and Rosin consider 2 grammes of sulphonal the proper quantity to be administered as a hypnotic, Drs. Salvetat and Mairet are of opinion that 4 grammes at least are necessary, a very strange discordance, considering that usually the difference lies the other way, French doses being in general very small. But as the good faith and skill of the investigators can in neither case be called to question, it must be presumed we are dealing here with race idiosyncrasies. Dr. Mairet has related among other the following typical instances: X., a man in good health, was, at 5 P.M. on a Thursday, given 4 grammes of sulphonal. He experienced no effect therefrom either during the night or the following day. On Friday 5 grammes more were given; the next morning his eyes were watery, his face weary, and his head dizzy. During the day he looked like a drunken man, but had no nausea or loss of appetite; he only felt sleepy. On Saturday night no sulphonal was given. X. slept well at night; but on Sunday morning the disturbances observed the day previous were still more noticeable, the difficulty in standing and titubation having increased, as well as somnolence and prostration. Yet his appetite was not impaired. On Monday morning, with the exception of slight hesitation in walking, all symptoms had disappeared, and by night he was in his usual state. The other subject, Y., took on a Thursday night 4 grammes of sulphonal, and experienced nothing either during the night or the day following. On Friday he was given 5 grammes, enjoyed a good night's rest, and the next day presented nothing abnormal in behavior or appearance, except a slight redness of the eyelids. On Saturday, at 5.15 P.M. he was again given 5 grammes of sulphonal. Soon after, while working, he dropped into a chair and fell asleep. At 8.30, on being aroused to go to bed, he rose half-dazed, stepped about reeling, saying, "I feel as if I were drunk," and with a maudlin smile, and his cap on one side of his head, staggered to his bed, where he enjoyed sound sleep all night. During the whole day following he acted like a drunken man,—would drop the objects he held in his hands, reel around the rooms, fall asleep when sitting, and get entangled with chairs and tables when walking, but never lost a meal for all that. After this, although no more sulphonal was given, the symptoms lasted until Tuesday, gradually decreasing, and finally disappearing on that evening. One point strikingly illustrated by the foregoing instances is the length of time necessary for the absorption as well as for the elimination of sulphonal. Its insolubility and indiffer-

ence to chemical agents, easily account for this slowness of action; they also indicate that sulphonal is essentially a cumulative medicine. But another interesting feature of Drs. Mairet and Salvetat's work is that unless they have been dealing with a different chemical, the nervous Frenchman needs a larger dose than his more phlegmatic neighbor on the other side of the Rhine.

After considerable discussion respecting saccharin, medical and sanitary authorities here have come to an agreement,—a compromise, if you like,—which was recently set forth quite fairly by Dr. Dujardin-Beaumetz in a public declaration. He said that, therapeutically, saccharin is a valuable addition to materia medica, but, as an article of food, it should be prohibited, *not because it is poisonous* (the italics are his), but because it is not an aliment, and can have no other possible use but to deceive the consumer. "Hence," he added, "it is possible without ceasing to be logical for one to condemn saccharin as a fraud in general alimentation, and yet to approve of it as a valuable medicine. Such is the stand I have always taken." As most readers of the THERAPEUTIC GAZETTE probably know, the importation of saccharin in France is now prohibited, and public opinion has supported the government in its action, for people here will not have saccharin in their currant jelly, or "sirop d'orgeat," if they can help it. But, as a medicine, that is a different thing. It is used more and more, and has proved of real value in many cases. For instance, Dr. Fourier, of Compiègne, has employed it with success in cases of aphthæ dependent upon measles. On painting them with a saccharin solution, he caused eight times the plates to disappear within twenty-four or thirty-six hours; only twice did they resist three days, and even then he had good reason to suspect the application was not performed properly. The solution should be as follows:

Saccharin, 1 gramme;
Alcohol, 50 grammes.

Dissolve. To make the wash, add a teaspoonful of the solution to half a tumblerful of water, and apply with a camel's-hair brush five times a day. It is unnecessary to use more concentrated preparations. In fact, they are almost dangerous, as one day Pharmacist Guilluy, while making the alcoholic solution for Dr. Fourier, had the curiosity to taste it by dipping his finger in and bringing it to his mouth. As a consequence, on the same evening, he felt his whole mouth burning hot, and the following morning had a severe aphthous eruption, which lasted for six days. It soon disappeared, however, and left no trace. The foregoing, by the way, shows that saccharin, like salicylic acid and other similar compounds with sweet taste and bland names, are caustics of no mean efficiency.

Dr. Charcot always retains the specialty of strange cases. The other day, at the Salpétrière, while treating of a variety of epilepsy which deserves the name of walking mania, he related the following typical instance: The patient, M., was employed in a Paris foundery to make deliveries of bronze articles in the city. He was accompanied with a driver to mind the horses and wagon, while he dealt with the customer and collected the money. For nineteen years he has been working for the same firm. On January 18, in the evening, after delivering the last lot of goods, he disappeared, leaving the driver to go back to the store alone. From this moment to January 26 the unfortunate M. lost all consciousness of his actions, when, at 2 P.M. "he awoke," as he said, standing on a bridge in an unknown town, and listening to the brass band of a passing regiment. On coming to his senses, he noticed his clothes were clean, his shoes in good condition, and no bodily harm had befallen him, but all recollection of his doings was lost, and he had no idea of the place where he happened to be. Unwilling to cause remarks by asking the plain question, previous experience having taught him better, he only inquired of the way to the railroad station, and there ascertained he was at Brest, some three hundred and sixty-five miles from Paris. Now counting his money, he found he had seven hundred francs left out of nine hundred he had collected, showing he had spent forty dollars in eight days, nothing out of the way, considering the railroad journey. Thus far, so good. Only, as no train left for Paris before night, M. bethought himself, to guard against another walking fit, of placing himself under the protection of the law, a dangerous proceeding in most civilized countries. The law in the present instance appeared in the shape of a "bon gendarme," to whom M. confessed his quandary, showing at the same time several vouchers, among which a certificate signed by Dr. Charcot. The gendarme had never heard of Dr. Charcot; but, with characteristic acuity, replied, "He knew that story;" and promptly locked up the Parisian. Six days were necessary to clear up the case, as

the Paris house had changed hands, and the new firm, being imperfectly acquainted with the man's antecedents, telegraphed at first to hold the prisoner. It was only on February 1 that M. was set free, but he lost his situation. The story is, no doubt, a strange one, and might lead to a different interpretation, were it not that Dr. Charcot has long been acquainted with the patient, knows him to be a temperate, steady man, married, and the father of two children, and has had him under treatment before for similar fits of unconsciousness, only less serious. The case, according to the celebrated specialist, is a form of epilepsy, and one of the reasons for the diagnosis is that the patient has been on previous occasions successfully treated with bromide of potassium. He had M. under his care for nearly four years, during which time three abscesses occurred. The bromide treatment gradually reduced the fits and their duration, to such an extent that the medicine was stopped last September. The patient was considered cured when the last outbreak took place. Verily, there are good times in store yet for the great American tramp. But policemen are so incredulous.

In consequence of Dr. Roux and Yversin's discoveries respecting diphtheria, local applications are now much thought of. At a meeting of the Society of Practical Medicine, Dr. Callias reported he had obtained good results from a five to ten per cent. solution of resorcin applied with a soft camel's-hair pencil every hour, night and day, in serious cases, and every two hours in mild ones. A one or two per cent. solution is to be at the same time sent with an atomizer into the mouth and nose, so that the spray shall penetrate to the larynx. Resorcin is thus easily exhibited, owing to its sweet taste, great solubility, and slight causticity. Dr. Alexander having expressed some doubts as to the complete harmlessness of resorcin, Dr. Cadet de Gassicourt remarked that in his hospital service he had used resorcin solutions in all degrees of concentration, without untoward results. At the same time he had some misgivings in regard to its efficacy in dangerous cases of diphtheria.

People like to be humbugged. Last week Dr. Cicard appeared before the Seine Correctional Tribunal on the charge of illegally practising medicine. The evidence showed he had a large and lucrative practice, and employed strange remedies. One witness, for instance, testified that the doctor wrote cabalistic signs on his prescriptions; another, that he had been ordered by him to hold a copper rod with both hands until it fell off; and still another, that he had been advised to stand on one leg. On being asked what he had to say, defendant replied he had an excellent defence in the shape of a simple document, which he would show to the court on condition the secret be kept. The judge having declined to make any such promise, after much hesitation the poor fellow reluctantly handed to the court a folded parchment, remarking he took this step only to avoid being sent to prison. The document staggered the judge, as it proved Dr. Cicard's medical diploma, in good and due form. Of course defendant had to be acquitted; but, on being asked why he had allowed himself to be prosecuted and risked going to jail, he replied that for five years after obtaining his diploma he had vainly tried to make a living by regular practice. Then, to avoid starvation, he hit upon the quackery dodge, and made considerable money. But now, that he had been obliged to show his diploma, the trick would work no longer, and he would be obliged to move to some other locality, where he would not be known as a regular physician.

PARIS, March 22, 1889.

BERLIN.

(From an Occasional Correspondent.)

Experiments with the Bacillus Cholerae—Weigert's Treatment of Consumption—Unique Cases—Bouillon Capsules—A Fatal Bet—Professor Liebreich's Jubilee—Medical Meetings.

Professor Koch, in conjunction with Professor Loewenthal, has recently made some interesting and valuable researches concerning the behavior of the bacillus of cholera on various culture soils. Loewenthal has succeeded in proving beyond doubt that the bacillus of cholera loses the capacity to produce its specific ptomaïne by prolonged pure cultures, but regains this capacity in presence of pancreatic juice. Again, he found that the bacillus in presence of pancreatic juice, and then only, could be destroyed by salol. Loewenthal made these observations first outside of the animal organism, and was naturally anxious to find whether this peculiar behavior of the bacillus, in presence of pancreatic juice and salol, could be verified also on the living animal. It is well known that it is a matter of great difficulty to produce cholera artificially in animals. Koch and French, experimenters, particularly Nicat

and Rietsch, of Marseilles, succeeded in this only, after many failures, after previously having rendered the stomach alkaline by large doses of sodium and the intestines nearly immovable by opium. This procedure allowed the bacilli, which otherwise invariably perish in the gastric juice, to reach the intestines and develop themselves there. Loewenthal used for his experiments guinea-pigs. The first animal was treated after Koch's plan, with sodium and opium, to illustrate the inocuousness of that ingestion; the second was treated likewise, and received besides 2 c.c. of a pure culture of cholera-bacilli in bouillon *per os*. This animal perished after forty-eight hours, under the usual symptoms of cholera. The third animal received the same treatment as the two other guinea-pigs, and, besides, 5 c.c. of the same pure culture; it perished in twenty-four hours. The fourth animal received 10 c.c. of the pure culture, and immediately after 20 cg. of salol. This animal did not get sick at all. In a second series of experiments Loewenthal gave to two mice bacilli flour impregnated with cholera-bacilli, as result of which both animals grew sick. One of the animals was left to itself, and the other received a dose of salol. This animal grew gradually better, and recovered completely ten hours after the ingestion of salol and twenty-five hours after the ingestion of the bacilli, while the other mouse perished in twenty-five hours. In a third series of experiments, Loewenthal gave to four guinea-pigs bouillon à la cholera-bacillus and flour, without preparation of the stomach and intestines, with sodium and opium. Two of the animals received the next day 20 cg. of salol; the two others received no salol. Of the two latter animals one only died, while the other recovered, which was also the case with the two animals which had received salol. It cannot be said with certainty whether the one animal succumbed to cholera or to another disease. As Professor Loewenthal's researches without and within the animal organism evinced the same behavior of the cholera-bacilli in presence of salol, we are justified in assuming that salol has properties antagonistic to the specific ptomaïne of the cholera-bacilli. Loewenthal intends to try the exhibition of salol in India, where cholera is endemic and epidemic, and has already addressed physicians, resident in India, on this highly important matter.

Weigert's apparatus for the cure of consumption by means of the destruction of the tubercle-bacilli engaged the interest of the Berlin Polytechnical Society at its meeting of February 8. The principle of the process and apparatus is the killing of the specific tubercular germs in the lungs by a high temperature. Weigert's apparatus consists of a metallic globe, into which a Bunsen burner is fitted. Over this globe a second one is placed so as to leave an interval of one centimetre between the two globes. The air enters the interspace between the two globes by means of small apertures, becomes heated on the wall of the inner globe by the Bunsen burner up to a temperature of 280° C. (568° F.), and then enters a mouth-piece, which has ingeniously-constructed valves for inspiration and expiration of air. These valves produce, of course, a very considerable loss of temperature, the patient inhaling air of about 160° C. (350° F.). This high temperature is singularly well borne by the patients, and the results obtained thus far appear encouraging. Krull, a practitioner of Mecklenburg, has some time ago advocated a similar plan of treatment of consumption,—viz., the introduction of sterilized, damp air of high temperature. His view was that a defective nutrition of the lungs favored the admission and development of the tubercle-bacilli, and that by an increase of the blood-supply of the lungs the local powers of resistance and recuperation could be materially heightened. The result of the introduction of air of the above description into the lungs is a vascular dilatation, and the passage of a greater quantity of blood without a simultaneous cardiac excitation. As damp air heated to a certain height does not decrease the elasticity of the blood-vessels, each cardiac contraction carries off the quantity of the blood previously admitted to the part. It is evident that through this increased admission and expulsion of blood a greater quantity of it will be propelled into the capillaries of the lungs, and that an augmented oxidation of blood will take place in a given time. Simultaneously, the discharge of carbonic acid gas is increased and the process of pulmonary nutrition is stimulated. The danger of pulmonary hemorrhage is, strange to say, not only not increased by Krull's inhalations; but, by equalizing dangerous centres of blood stagnation, is actually diminished.

The vastness of the medical domain is strikingly illustrated by the so-called rare or unique cases, which, instead of decreasing, as we might naturally suppose, appear to be steadily on the increase. A large medical centre like Berlin is, of course, a fruitful soil for "unique

cases." The singular case of acromegaly, or giant's growth, which Professor Virchow presented and described recently to the Berlin Medical Society, has probably been already reported in American journals. I will, therefore, abstain from further details, and only add that a Prussian thaler, which has almost the diameter of an American dollar, fitted very neatly into the ring of this human "Jumbo." A German Barnum, by the way, has undertaken to exhibit the giant to the public. Another singular case came recently under the observation of Professor Leyden in the Royal Charité. A young lady swallowed a piece of bone of considerable dimensions, which produced serious paroxysms of coughing, but remained in the throat. A physician examined the patient with the œsophageal bougie, but was unable to detect any foreign body. The cough and severe pains continued for six months. Professor Leyden took charge of the case after that, and diagnosed bronchial catarrh with asthmatic symptoms. His treatment, however, proved absolutely useless. He was about to send the patient to a southern watering-place, probably to get rid of the case, when one day the lady came to him, bright and happy, and told him that she was "all right," a large and pointed bone having come up in a severe and very painful paroxysm of coughing. Professor Leyden said it was miraculous that a bone of such dimensions could have lodged for eight and a half months in the part without producing any serious disorders. Though it is impossible to exactly say where the bone was lodged, it was, in Professor Leyden's view, probable that it became fixed with its point in the mucous membrane of the trachea, or, even deeper, in a branch of the bronchi.

A similar case came this week under the observation of Professor Bardeleben, of the Charité. A patient, 54 years of age, suffered from chronic hoarseness, for which no valid cause could be ascertained. After the death of the patient the cause became very clear. Under the right vocal cord there was found a one-mark piece (about the size of a quarter of a dollar), which was wholly black. The patient had never said anything about the swallowing of the coin, and it is questionable whether he knew anything about it himself.

Two other singular cases are reported by Professor Fürbringer, of the City Hospital, Friedrichshain. A young lady had died in the hospital under obscure peritonitic symptoms, and the autopsy revealed at the junction of the small and large intestines two hundred and fifty cherry-kernels and three plum-stones. The diagnosis has been uncertain, though a neoplasm of the intestines was looked for. The second case was that of a man, who evacuated one day ninety-eight plum-stones, and the following day one hundred and thirty-seven plum-stones, in all two hundred and thirty-five. The malady, which could not be properly diagnosticated previously, disappeared completely. In both cases the kernels and stones were not ingested at once, but gradually and probably in a long course of time.

The numerous services which the kitchen and the dinner-table have derived from the progress of chemical science have again been increased by a valuable innovation,—viz., the bouillon-capsules, invented by Dr. Quaglio. The capsules have been officially examined by Dr. Bischoff, the city chemist of Berlin, and have been pronounced as an acquisition to the household and of particular value for the sick-room. They contain the essential constituents of a nutritive bouillon in the smallest volume. The extractive matters of meat, fat, spices, and salt are united in proper proportions, and enclosed in gelatin capsules. These capsules are simply placed in hot water, where they dissolve immediately, and furnish a perfect bouillon, which cannot be distinguished from bouillon freshly prepared.*

One of those wretched bets on extraordinary feats in eating or drinking has this week caused the death of a participant. A butcher bet against two "weisse" (weiss beer) that he could eat up the contents of a mustard-glass, containing half a litre. The result was a terrible burning in the stomach, severe vomiting, and death on the same day.

A great reception was tendered yesterday by the medical world of Berlin to Professor Liebreich, the occasion being the fiftieth anniversary of that well-known chemist and parmacologist. Liebreich's name is nearly as well known in America as in Europe. His principal merits are the discovery of hydrate of chloral and its introduction as a hypnotic, the discovery of two new anæsthetics,—viz., butyl chloral, and chloride of ethyl and of lanolin. He is the editor of the *Therapeutische Monatshefte* and chief of the Pharmacological Institute of the Berlin University. Professor Liebreich has, besides, the distinction of being the most dreaded examiner of the Berlin faculty, a distinction which he shares, I be-

* The capsules can be obtained from Quaglio, Schi bauer, Damm 16, Berlin.

lieve, with one of the editors of the THERAPEUTIC GAZETTE, who occupies the same position in a Philadelphia school.

The time of medical meetings and congresses, which are really a feature of medical life in Germany, will soon be on hand. The first and principal meeting of the year is the eighth Congress for Internal Medicine, which will take place, as annually, in Wiesbaden, April 15–18, under the presidency of Liebermeister, of Tübingen. Subjects of the highest interest will be discussed by the most celebrated of German clinicians. We merely mention the following: 1. "Ileus and its Treatment," Curschmann; 2. "Gout and its Treatment," Ebstein; 3. "The Functions of the Stomach in Tubercular Phthisis," Immermann; 4. "Male Impotence," Fürbringer; 5. "Preparation and Action of Medicines," Lewin. Your correspondent will attend this important Congress, and for the benefit of the subscribers of the THERAPEUTIC GAZETTE will stenograph all essential parts of the discussions.

BERLIN.

(From our Special Correspondent.)

From the time when the investigations of Robert Koch first furnished us with a scientific and probable theory as to the etiology of tuberculosis, there has been no lack of therapeutic procedures proposed, which, resting on the facts so obtained, should prevent the development of the tubercular bacillus within the system. As yet, however, they have all led to no result; fortunately, however, the results of investigations as to the prophylactic treatment of tuberculosis have been somewhat more successful. With the better knowledge of the attributes of the cause of tuberculosis, we are becoming more and more fitted for the discovery of some measure which may protect the economy from the invasion of these bacilli. Very recently a pupil of Koch, who, for a number of years has been carrying on most careful and exact studies in the Berlin Hygienic Institute, published a communication in the *Zeitschrift für Hygiene* containing the results of his studies as to the conditions of development of the bacillus of tuberculosis outside the animal body. We may assume that these studies of Dr. Cornet are already well known, and therefore will only briefly recapitulate their main features. Dr. Cornet inoculated three hundred and eighty-eight guinea-pigs with one hundred and forty-five different kinds of dust; of these, three hundred and eleven animals were inoculated with dust taken from rooms occupied by phthisical patients. Of these latter, one hundred and sixty died soon after infection through the disease (peritonitis, etc.) produced by the injection. Fifty-nine, or one-fifth of the animals inoculated, were found to be tuberculous when killed; eighty-five were normal. Of the seventy-seven animals, on the other hand, which were inoculated with dust from other localities, thirty-seven died from various diseases; in the remaining forty no pathological process could be discovered when they were killed.

At the meeting of the Berlin Medical Society, held on March 13 of this year, Dr. Cornet gave an address, in which he extended his conclusions from the results obtained in his more recent observations, and claimed that his results warranted him in formulating rules for the actual prophylaxis of tuberculosis. In the last few years there has been much talk about the "ubiquity" of the bacillus tuberculosis, and the conclusion drawn that those who escape the action of this infection are mainly protected through some individual peculiarity of disposition. It has been overlooked, however, in formulating these conclusions, that the universal distribution of the bacillus by no means presupposes the necessity for the existence of these bacilli in a free condition in the air. That, however, the air is the chief carrier of the infective virus of phthisis, is regarded by Dr. Cornet as having been absolutely demonstrated. All the tubercular bacilli which reach the atmosphere must have originated within the animal body, and this purely parasitic nature of the bacilli is the starting-point on which the theory of prophylaxis rests. The object to be attained, therefore, is evidently to deprive the bacilli of all noxious properties immediately on their exit from the organism. Although without doubt the fæces and urine in certain cases contain bacilli, yet it is generally admitted that there is no marked danger of infection from these sources, since it may be believed that in these excreta the tubercular bacilli would be rapidly destroyed by the bacteria of putrefaction. Infection through the milk and flesh of tubercular animals introduced within the digestive tract is more worthy of attention; but by far the most frequent source of infection is without doubt the tuberculous individual in whom the pathological process is located in the lungs. Here the expired air as the vehicle for this virus does not come under consideration, since the investi-

gations of Naeglé and others have shown that neither evaporation from the moist surface of the respiratory tract, or the forcing over it of a violent current of air, as in coughing, is able to carry the bacteria into the atmosphere. Tuberculous individuals, therefore, are only dangerous through their sputum, and only then when it is dry and so distributed through the atmosphere that it may mix with the inspired air. That the healthy respiratory tract possesses means of protecting itself from the entrance of infective matter is clearly established, while it is also proved beyond doubt that under certain circumstances the respiratory passages may serve as the point of entrance of this virus to the lungs, and there be the starting-point of the phthisical process. If we now attempt to determine to what degree phthisical individuals, under ordinary circumstances, run the risk of causing the distribution of the bacillus, we will find that if phthisical patients started with the firm idea of destroying themselves and all around them as rapidly and as certainly as possible, they could not better accomplish their object than through the practices which we are every day encountering: for on all sides we find the universal habit of depositing the expectoration either on the floor or in the pocket-handkerchief,—a procedure which is of all best calculated to favor the distribution of the sputum in dust form through the atmosphere. The sputum kept in the pocket, at the temperature of from 25° to 30° C., soon becomes dry, and through friction is rubbed to fine powder, and by subsequent use of the handkerchief by the patient himself is distributed through the atmosphere. The same applies to soiled bed-clothes, shirts, etc.; in fact, Dr. Cornet has been able to find bacilli in the dust of hospital wards, hotel rooms, private dwellings, and prison cells in which phthisical patients have expectorated on the floor or in the pocket-handkerchief, while they were never found in rooms in which the spittoon had invariably been used. The prophylactic procedures based upon these observations are self-evident. All hygienic rules fall in importance far beneath the one axiom that sputum should be deposited only in spittoons, whether it come from a known phthisical individual or not. This may be attained by showing the phthisical patients that it is a means to their own protection; showing them that they otherwise are continually infecting themselves by taking new germs into their lungs. Therefore all dwelling-rooms, hospital wards, prisons, etc., should be furnished with spittoons, and direction given that expectorated matter should only be deposited in them. In several of the Berlin hospitals this rule is already in operation, and in these hospitals dust collected from rooms occupied by tubercular cases has been found to be absolutely free from bacilli. Where, as is the case in most of our large hospitals, it is not impossible, the contents of the spittoons should be rendered harmless by steam, while the spittoons themselves should always contain a little water. In case of death from tuberculosis, the dwelling-rooms should be thoroughly disinfected. The walls may be rubbed down with freshly-baked bread,—a procedure proposed by Esmarch and based on scientific grounds. Bedding, carpets, etc., should likewise be well disinfected. So, also, in changing dwelling-places, even although they may not be known to have been occupied by tuberculous patients, they also should likewise be cleaned and purified. In hospitals, the separation of tuberculous patients from the other sick is desirable. Dr. Cornet believes that through the careful observation of these prophylactic principles, it will not be long before there will be a marked reduction in the spread of tuberculosis.

MORPHINE-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the THERAPEUTIC GAZETTE of February is an interesting article on morphine-poisoning from the pen of T. H. Williams, M.D., in which he thinks the life of his patient was saved by electricity, faradic current. Three years ago this winter I had a severe case of morphine-poisoning. The patient was a lady aged about 30.

I tried all the usual remedies, but my patient kept sinking lower every hour. After about four hours hard work to keep her awake and maintain respiration, I sent for counsel and a small faradic battery that the druggist had. It was of the kind that the current is induced by simply turning a crank. The patient was very low when the doctor and battery arrived. We at once placed one cup over the phrenic nerve by the side of her neck, and the other over the diaphragm. The effect was almost magical. She revived at once, and in a very short time was able to say a few words and swallow a little stimulant without strangling. We cut off the current several times to note the effect. She would at once lapse into an unconscious condition

A few turns of the battery would again revive her. All the medicine she got after the arrival of the battery was stimulants,—alcohol and aromatic spirits of ammonia. We kept her awake for a couple of hours with the battery very easily, when the effects of the morphine subsided. I am fully convinced that electricity saved her life, as it appears to have done with Dr. Williams's case.

I believe it is a most valuable agent in morphine-poisoning, and perhaps in some other causes of poisons. It is certainly an easy task to apply it.

Yours truly,

L. R. MARKLEY, M.D.

KIMBALL, NEB., February 23, 1889.

ADHATODA VASICA.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Two contributions in your issue of March 15—the one a report of studies of the diphtheria bacillus, by Drs. Roux and Yversin; the other of Loewenthal's investigation of a remedy for cholera—point to a possible field of usefulness for the Indian drug *Adhatoda vasica*. This drug, of which a full report will appear in the forthcoming number of the *Druggists' Bulletin*, seems to me to be exceptionally worthy of investigation as to its power to destroy bacteria in the human system. From what is already known concerning it, it would appear to be perfectly harmless as applied to the higher orders of life, both animal and vegetable, but to increase in toxic power as applied to organisms successively lower in development. Thus, it has been found harmless to the dog in 15-gramme doses, but fatal to flies, fleas, mosquitoes, leeches, the pupæ of aquatic insects, and even to frogs. In the vegetable kingdom it is harmless as applied to the higher orders, but immediately fatal to various classes of submerged and floating aquatics, to mould, etc. Theoretical considerations certainly possess some degree of value, and in this case they point very strongly towards the probable value of this drug in sporadic diseases. I shall be greatly pleased to hear reports of its action in diphtheria. The most promising method of application would seem to be in connection with, or following the application of pepsin to the membranes, supplemented by its internal administration.

H. H. RUSBY, M.D.

Notes and Queries.

THE INFLUENCE OF BITTERS ON THE DIGESTION AND ASSIMILATION OF ALBUMINOID MATTERS.

Some experiments made by LEVEN* go to show that the ordinary bitters (extracts of cinchona, quassia amara, nux vomica, gentian, etc.) promote for a time digestion and assimilation; they are, however, soon followed by loss of appetite and dyspeptic troubles. According to Leven's interpretation, these medicaments excite the solar plexus and energize the activity of the gastric glands and muscular movements, but soon produce by exhaustion a diminution of this activity and an irritated and congested state of the gastric mucous membrane.

Several years ago Buchheim and Engel undertook a series of experiments to ascertain the influence of bitter substances on digestion, and concluded that "these substances have no action on the transformation of albumen into peptone, and they oppose fermentation." It is by virtue of this property, according to these physiologists, that bitters act so favorably in certain diseases of the digestive tube.

Since then, Tschelzeff, chief of Professor Botkin's clinic, has taken up anew this interesting question of the influence of bitters on digestion and on the nutrition of the animal organism in general.† His conclusions are "that extracts of the so-called pure bitters which are usually prescribed with the view of stimulating the secretion of gastric juice, and of aiding digestion, so far from having any beneficial action of that kind, are absolutely injurious, in that they retard the digestive functions." He experimented with extracts of aurantium, gentian, trifolium, absinthium, columba, cascarilla, and quassia, on (1) gastric digestion and the secretion of gastric juice; (2) pancreatic digestion and the secretion of pancreatic juice: (3) the secretion of bile; (4) fermentation; and (5) nitrogenous metamorphosis. He arrived at the conclusion that bitter extracts, even in small doses, interfere with artificial gastric digestion, and also with the gastric digestion of animals, but not to so great an extent. Large doses of bitter extracts diminish the secretion of gastric juice, although small doses effect a slight and transitory increase of it, the diges-

* "La Névrose," Paris, 1887, p. 34.

† *Bulletin Générale de Thérapeutique*, t. cxi. p. 90; *London Lancet*, 1886, Part I., p. 938.

tive power of the fluid being, however, in all cases diminished. Bitter extracts have no effect on the secretion of pancreatic fluid, but they nevertheless retard hypogastric digestion. The action of bitter extracts on the secretion of bile is various; extract of absinthium, extract of trifolium, and large doses of extract cetrarin slightly increase it, while extract of quassia, extract of columba, and small doses of extract cetrarin have no effect at all. Bitter extracts have no antifermentative effect, but rather hasten and promote fermentation, especially in large doses. The putrefaction of blood and urine is favored by the presence of pure bitters. With regard to the effect of bitters on nitrogenous metamorphoses, the Russian experimenter found that under their influence the quantity of waste nitrogen in the urine and fæces was increased; in other words, disassimilation was accelerated, while on the other hand assimilation was diminished.

It would seem from these experiments that bitters are of very questionable utility in the treatment of digestive disorders. It will not do, however, to adopt this conclusion without considerable reservation; experiments made in test-tubes in the laboratory and experiments on animals should not be allowed to outweigh the results of clinical observation; and, to quote the words of Lauder Brunton, "the evidence of clinical experience in regard to the utility of bitter extracts is so strong that it is plain, either that the experiments have been imperfectly conducted or that we must look to some other organ than the stomach for an explanation of the beneficial action of bitters in dyspepsia.*—*Boston Medical and Surgical Recorder*, February 28, 1889.

ANTIPYRIN IN SCIATICA.

Dr. Gabriel Covarrúbias, of Limache, reports a case in which he cured sciatica with antipyrin. The patient had been confined to his bed for two months, and was unable to move his left leg. The hip-joint was so painful that the gentlest examination with the fingers could scarcely be borne. The slightest pressure over the gluteal, sciatic, and trochanteric regions made the patient cry out with pain. Sleep had been impossible for some nights, and there was considerable wasting. The severity of the symptoms, coupled with the fact that there was slight rise of temperature every evening, led Dr. Covarrúbias to suspect the existence of an iliac abscess; an exploratory puncture was, therefore, made, with a negative result. Sciatica having then been diagnosed, injections of morphine in the affected part, anodyne applications, general anti-rheumatic treatment, salicylate of soda, iodide of potassium, sulphate of quinine, tincture of gelseminum, bromide of potassium, etc., all were tried without the least effect. Tonic treatment with iodide of iron, cod-liver oil, etc., proved equally futile. Antipyrin was then given in doses of 50 centigrammes, with an equal quantity of quinine, three times a day. The day after this treatment was begun the patient wished to get up; the pain had ceased, and he could move the affected limb quite freely. Ten days afterwards he left the hospital completely cured, and having gained considerably in weight.—*British Medical Journal*, March 16, 1889.

* "Pharmacology, Therapeutics, and Materia Medica." American edition, p. 365.

We clip the following from the college paper of the University of Michigan: "The faculty is shortly to lose one of its most valuable and widely known members. Mrs. Stowell, who has been connected with the botanical department, and who has contributed so largely to its success, has been appointed special microscopic artist of the botanical department at Washington, at a salary of two thousand dollars per year. While we join with our readers in extending congratulations to Mrs. Stowell on account of her new position, yet we voice the sentiment of the students in regretting her departure. No one has had work under her direction, but will testify to her inspiring influence in awakening a true interest in her students for the work in which they are engaged. The lady students will lose a warm friend, while the social circles of Ann Arbor will miss her exceedingly."

We desire to call the attention of American botanists to the above for the reason that heretofore structural botany has occupied but little, if any, of the attention of the botanical department at Washington. While Dr. Vasey is doing such thorough work in systematic botany, he is to be congratulated in having secured such assistance in what is called "the new botany." Mrs. Stowell has taught this subject to pharmacy students for twelve years, and the pages of the Therapeutic Gazette have been frequently illustrated with her drawings.

A NEW HYPNOTIC.

Signor Gustavo Poppi, a medical student of Bologna, recently described to the Medico-Chirurgical Society of that city the effects of a new hypnotic, which he proposes to call "uralium." This substance is produced by the combination of chloral hydrate with urethan. From experiments on animals and on the human subject, Signor Poppi concludes that uralium induces sleep more quickly and more certainly than any other known hypnotic. He says that it causes no alteration of the blood-pressure, nor bad effects of any kind. Uralium has been given in various cases of heart-disease, in insanity, hysteria, and other nervous complaints, and always with the best results, even when other hypnotics had failed. Without throwing the least doubt on Signor Poppi's good faith, we may, perhaps, be allowed to hint that experienced practitioners will recognize in his enthusiastic account of his discovery the familiar trumpet-blast that heralds the first appearance of so many new remedies, "which have their day and cease to be," or which, at any rate, soon lose their title to therapeutic infallibility.—*British Medical Journal*, March 16, 1889.

RESECTION OF A PORTION OF THE ILEUM.

Dr. Fredrico Rubio, of Madrid, recently communicated to the Spanish Royal Academy of Medicine an interesting case in which he performed successfully a somewhat extensive resection of the gut in the wards of the Instituto de Terapéutica Operatoria of Madrid. The patient was a woman, 32 years of age, who, after eating a quantity of cooked vegetables, was seized with violent abdominal pain, a swelling appearing at the same time in the right groin. Vomiting and constipation followed. Subsequently the tumor in the groin became inflamed and opened in two places,—viz., at the external inguinal ring and at the lower part of the right labium. From these fistulous openings fæces kept continually escaping, rendering the patient's condition most deplorable. Attempts were made during many months to get these openings to close up, but, although temporary improvement followed some of the means used, it ultimately became evident that unless some radical operation was resorted to the patient must necessarily succumb. Having given purgatives and enemata to empty the bowels, and a disinfectant bath to cleanse the surface, Dr. Rubio performed laparotomy, making a small incision in the spot usually selected for the ligature of the external iliac. This brought into view the cæcum with the vermiform appendix. He then hooked up the coils of the ileum one after another; the third of these presented an opening with fungiform edges three centimetres and a half in length by two centimetres and a half in breadth, and surrounded by a very unhealthy-looking area,—which, indeed, occupied the whole circumference of the gut. Under these circumstances, it was felt that any attempt to close the opening would assuredly end in failure, and that the only alternative was to excise a portion of the gut. About eight centimetres were consequently excised, together with a V-shaped piece of the mesentery; catgut sutures were applied, and the patient made a good recovery, normal defecation taking place on the second day after the operation.—*The Lancet*, March 2, 1889.

THE PHARMACOLOGICAL PROPERTIES OF THE MUSCARI COMOSUM.

The *Muscari comosum*, Mill., or *Hyacinthus cosmosus*, L., is a tunicated bulb with blue and violet flowers, and is very common in flower-gardens. All the parts of the plant—the bulb, stem, leaves, and flowers—contain a mucilaginous juice, with an acrid and bitter taste. Boiling the bulbs deprives them of their bitterness, and in this form they have been used as an article of food. According to Dr. Curci (*Répertoire de Pharmacie*, March 10, 1889), when a watery decoction of the bulbs is treated with boiling alcohol, the mucilage is precipitated, and the bitter part dissolved, and may be separated, in cooling, from the alcoholic solution. The deposit treated several times with boiling absolute alcohol acquires a gummy aspect and a bitter, acrid taste; it is insoluble in cold water, but soluble in hot water. This substance appears to be analogous to quillaiaic acid described by Kobert, and has received the name of comosic acid by the author, who has made a number of experiments as to its physiological action. Dr. Curci does not claim to have obtained this substance in a pure condition, and the effects of the doses employed cannot, therefore, be regarded as absolute. He concludes that the active principle of *Muscari comosum* is an acid, probably analogous to quillaiaic and polygalic acids. It has a physiological action similar to that of saponine, to which pharmacological group it apparently belongs. It possesses the power of local irritation, although but slow in

its action, and when introduced in the blood it paralyzes the organs of circulation through action on the vaso-motor system. Vascular paralysis precedes the paralysis of the heart, as is shown by production of the œdema of the lungs and other viscera in mammals, and an empty condition of the heart of batracians. From the therapeutic point of view the author believes that the decoction of *Muscari comosum* may be employed as an expectorant in catarrhal affections of the respiratory passages in the same manner as ipecac, squills, etc., and he proposes to test its therapeutic action in these conditions, and promises to subsequently publish his results.

ULCERATION OF THE TONGUE AND MOUTH CURED BY OPIUM.

At the meeting of the Medical Society of London, held February 25, 1889, MR. SHIELD showed a case of ulceration of the tongue and mouth cured by opium (*Lancet*, March 2, 1889). A carpenter, aged 56, had suffered for three years from obstinate ulceration of the sides of the tongue and gums. The affection varied in severity from time to time, but was always a serious trouble, and sometimes prevented him from eating or speaking. No cause was attributed for the occurrence of this malady. He had been a temperate man, and had never suffered from syphilis, or been employed in glass-blowing, or was immoderately fond of pipe-smoking. He had, however, been living in a poor way, and his general health had deteriorated greatly. A variety of treatment had been adopted without relief. On examination, the man looked pain-racked, worn, and haggard. There were marked fætor and salivation. The left side of the tongue was superficially ulcerated in several places, the ulcers being covered with débris of food and superficial slough. The right side of the tongue was less affected. The gums were ulcerated round the teeth and the posterior molars were loose. The mucous membrane was healthy, excepting in the situation of the ulcers. The glands beneath the jaw were enlarged. The ulcers were acutely painful, and the man had to subsist upon fluid nutriment, which he swallowed with difficulty. For three weeks the tongue was treated without any benefit. The remedies employed were small doses of blue pill and colchicum, potassium iodide, and tonics; locally, solutions of cocaine and antiseptic mouth-washes. A solution of chromic acid seemed only to aggravate the malady. After three weeks the use of opium was commenced; an opium pill of 1 grain administered thrice daily, and a simple carbolic mouth-wash used locally. In three days the pain was much less, and the ulcers were decidedly more healthy in appearance. In three weeks the ulcers had entirely healed, the only sign to indicate their previous presence being the glazed appearance of the sides of the tongue and the loose teeth. The man, being able to eat and drink freely, had wonderfully improved in appearance. The use of opium in this case was suggested by a paper read by Mr. George Pollock and published in the *British Medical Journal* of April 26, 1884. There he narrated a case very similar to the above, though much more severe, where the effects of opium were most beneficial. His patient had undergone a variety of treatment, including the application of nitric acid, by an eminent authority. The action of opium was difficult to explain in such cases; its undoubted efficacy in painful and sloughing ulcers was perhaps hardly enough appreciated in the present day.

THE NOCTURNAL INCONTINENCE OF URINE IN CHILDREN.

In an interesting paper published in the *Archives of Pediatrics*, April, 1889, DR. SIMON BARUCH highly recommends the use of belladonna, or atropine, for the treatment of nocturnal incontinence of urine. His practice is to order a sufficient quantity of atropine in the afternoon at four o'clock and at bedtime to insure dilatation of the pupil: $\frac{1}{64}$ of a grain to children from 6 to 10, double the quantity to children up to 14, administered at these hours, usually suffices. If the pupils are widely dilated when the next dose is due it is omitted. The essential point of this treatment is that the pupil must be dilated during the sleeping hours, showing that the system is under the influence of atropine. Dr. Baruch's results would appear to show that this treatment will be followed by the most successful results.

THE ACTION OF ANTIPYRIN ON THE CONTRACTILITY OF THE UTERUS.

Antipyrin has been recommended by several authorities as an analgesic during labor. It has recently been investigated by PROFESSOR PINZANI in this connection, who publishes the following as the results of his studies in the *Internationale Klinische R...*

schau for March 3, 1889. Antipyrin only to a certain extent diminishes the severity of the labor pains, and accomplishes this by reducing the degree of contraction of the uterus. This result appears about two hours after the administration of the antipyrin hypodermically, while four and five hours elapse before any effect is evident when it is given by the mouth. Diarrhœa is caused in suckling children when antipyrin is given to the mother during the puerperal state. The doses which Professor Pinzani employed in his experiments were 45 grains, 30 grains, and 15 grains daily, and in some cases only 15 grains every other day. The estimation of the degree of the contractility of the uterus, before and after the administration of the remedy, was accomplished by the application of the hand to the abdominal walls, or by the introduction of a manometer, consisting of a rubber ball inserted into the uterine cavity.

HEADACHE AND ITS RELATION TO THE RETENTION OF URIC ACID.

The etiology of many forms of headache is still quite obscure. Dr. A. Haig maintains that one variety of periodic headache is directly due to the retention of uric acid in the system. The usual sequence of events, according to him, is as follows:

There is a time (say seven to ten days) of good general health, active nutrition, and bodily activity, with plus formation of uric acid and urea, and concomitant rise in acidity. As acidity rises, uric acid comes to be retained, and at the end of four or five days several grains may be regarded as stored up in the liver and spleen. Then come dyspepsia, gastro-intestinal catarrh, and hepatic congestion (and Dr. Haig is not by any means certain that this hepatic congestion and gastro-intestinal trouble may not be the direct result of the accumulation of uric acid in the liver and spleen). These quickly result in general diminution of absorption and nutritive changes, with lessened formation of uric acid and urea and a fall in acidity; and lastly, as the result of this falling acidity, there comes a rush of the stored uric acid into the blood and the headache begins.

Such a sequence may be seen to some extent in the figure that accompanies his paper on headache (*Transactions*, 1887), for there the urea drops from five hundred and sixty-one grains to three hundred and sixty-three grains in the four days that immediately precede the headache. Although acidity was not estimated in this instance, there can be no doubt that it followed and shared in the fall of urea to a large extent. Such a sequence explains the periodicity of this kind of headache, and the way in which it comes to occur every week or ten days for many years, varying only in degree with the corresponding variations in nutrition. It is also evident that any causes which affect digestion will influence the attack in one of the above ways; while all causes of debility, by weakening the nerve-centre on which the uric acid acts, will render it more sensitive (the reverse of the action of bromides) and the attacks more frequent. A knowledge of these facts gives him almost complete power either to cause or cure this headache in himself and other sufferers.

The good effects of salicylic acid, and the salicylates generally, in this variety of headache, are due to the circumstance that they facilitate the excretion of uric acid, and thus prevent the retention of excessive amounts within the body.—*Medical Record*, March 30, 1889.

THE HYPODERMIC EMPLOYMENT OF LACTATE OF QUININE.

The superiority of the lactate of quinine for hypodermic injection is well recognized on account of its great solubility,—one part in four of water,—and the large percentage of quinine which it contains (seventy-eight per cent.). Nevertheless, numerous complaints have appeared as to the unfavorable results which have followed its employment, especially as to the failure to attain the high degree of solubility as stated above. Pierre Vigier, in the *Gazette Hebdomadaire de Médecine et de Chirurgie*, March 15, 1889, states that the solubility of the well-crystallized salt of quinine is only one part in ten of water. This decrease in solubility may be avoided, according to the author, by strict attention to certain details in the method of preparation of this salt. Lactate of quinine may be made either by double decomposition, or by precipitation of the sulphate of quinine and its solution in lactic acid; the latter process is the one which the author prefers. The following is the method of preparation:

21.65 parts of the sulphate of quinine should be dissolved in 400 parts of water with 25 parts of sulphuric acid, diluted to one-tenth; then precipitated by an excess of ammonia. The quinine so precipitated should be rubbed up with sufficient lactic acid (about

5 parts, in water); and 100 parts of distilled water, 180° C., to clear up the solution. It should then be placed on a water-bath and reduced to 100 parts by heat. When cooled, it should be filtered, and may be preserved in a vial. This solution will contain exactly one part of lactate of quinine for every five parts of solution.

ARSENICAL POISONING FROM GREEN CANDLES.

Attention has been called in a daily contemporary to a novel source of atmospheric contamination with the fumes of the poisonous metals. At a children's party last Christmas a number of the little guests, as well as several of the adults, were seized with curious and inexplicable symptoms, which could not be traced to the ingestion of any particular food or liquid of which they had partaken. Attention was then drawn to the candles on the Christmas-tree, many of which were green, and these, when submitted to analysis by the county analyst, proved to contain Scheele's green, the red candles, moreover, being colored with vermilion. As we are not told what the symptoms were, it is not possible to formulate a definite opinion as to the likelihood of their being due to the incriminated candles, but the warning is opportune on general principles, and our sanitary authorities will do well to exercise a little surveillance in this direction.—*Medical Press and Circular*, March 13, 1889.

RELATION BETWEEN CHLOROSIS AND MENSTRUATION.

At the meeting of the Obstetrical Society of London, held March 6, 1889, Dr. W. Stephenson, Professor of Midwifery, University of Aberdeen, read a paper on the above subject, which consisted of an analysis of two hundred and thirty-two cases (*Lancet*, March 23, 1889). The author observed that in the rapid progress of uterine specialism, chlorosis, in its relation to menstruation, had been too much neglected by the gynæcologist. The two hundred and thirty-two cases were divided into two groups,—1, where the illness was primary and occurred before the twenty-third year, comprising one hundred and eighty-three cases; 2, where the attacks were of the nature of relapses after a period of good health (forty-nine cases). Chlorosis was regarded as due to a constitutional state; but the diathesis was not necessarily associated with an impairment of the development of the body, and was not, to any marked degree, connected with defective health previously to the onset of the disease. The influence of the chlorotic constitution on menstruation before chlorosis sets in was first discussed. Tables were given to show that the tendency of the chlorotic diathesis is to accelerate the age at which menstruation first appears, and that chlorosis by itself is not a cause of retarded appearance of the catamenia. At the same time, in one-half of the cases, the functional activity is defective, and is chiefly characterized by lengthening and irregularity of the intervals and scantiness in the amount of the flow. The author's statistics were against the opinion that there is, a menorrhagic form of chlorosis. In 96.6 per cent. the effect was to diminish the activity of the function, the remaining fraction being complicated with ovarian irritation. In 58.7 per cent. menstruation became scanty and irregular, and in many cases painful, while in 37.8 per cent. there was amenorrhœa for various periods. A table was given to show that there are two marked chlorotic periods,—the one, of primary attacks, from the age of 14 to 21; the other, of secondary attacks, from 24 to 31. The number of cases of the disease presents a regular curve, beginning at the age of 14, and rising steadily to a maximum between 18 and 19, then rapidly falling, to disappear altogether at 22. The tendency to secondary attacks manifests itself first at the age of 24, rises to a maximum between 26 and 28, to again disappear at 32. That there may be a third period is probable, as two cases were recorded at the ages of 39 and 41. This law applies to attacks of the disease with distinct intervals of good health between, as distinguished from the simple relapses, after periods of imperfect convalescence, frequently met with after a primary attack. The curve of menstrual age, compared with the curve of the onset of chlorosis, does not bear out the opinion that "foremost in etiological importance is the period of the first appearance of the catamenia." The fact of a periodicity in the attacks is also against it. The cause of this periodicity was considered, and the general conclusion arrived at is that imperfect evolution of menstruation, as evidenced by scantiness of the flow and irregularity of the periods, is as regular a feature of chlorosis as the imperfect evolution of the red corpuscles of the blood. These constants were independent one of the other, though a close relationsh existed between them whereby the reprodu

tion and development of the red corpuscles of the blood were governed by, or form part of, the menstrual cycle; while both were influenced by a greater rhythmic action which determines the time and activity of development, growth, and reproduction.

AN EARLY SIGN OF ENDOCARDITIS.

Every one who has watched a case of acute articular rheumatism and has noted the appearance, during its course, of valvular lesions of the heart, must have wished for some means whereby the intercurrence of endocarditis might be detected at an early period. Usually the first sign of this complication is a murmur at one or other of the cardiac orifices, an indication that the valves are already involved in the inflammatory process.

Dr. Duclos, of Tours, writing in the *Revue Générale de Clinique et de Thérapeutique*, January 17, 1889, records a fact of his experience, in regard to commencing endocarditis, which may possibly be of value as an aid in the early recognition of this affection. While in charge of a military hospital he chanced to have a large number of young soldiers suffering from acute articular rheumatism under his care. One day, while listening to the heart-sounds of one of these patients, his finger being at the same time on the radial pulse, he was struck with the want of synchronism between the ventricular contraction and the pulsation at the wrist, the latter being delayed about two-thirds of a second. The following day a systolic apex murmur was heard. Thinking that this retardation of the radial pulse might have some significance in connection with the subsequent development of endocarditis, he took pains to note its occurrence in other cases, and found that it was followed by a murmur at the end of from twenty-four to thirty-six hours in every instance. These observations were extended over a period of several years, and were confirmed in a number of cases by Professors Parrot and Potain.

The author has no conclusive theory to offer in explanation of this phenomenon, but he thinks that it is probably due to a weakening of the muscular fibres subjacent to the endocardium. He compares it to the weakened respiratory murmur frequently observed at the beginning of a pleurisy a few hours before a friction-sound is developed or effusion takes place. It would be interesting to learn whether this want of synchronism is present in the beginning of endocarditis arising in the course of other diseases, but the author has few observations bearing on this point to record. He has noted it, however, in two cases of typhoid fever and in three of erysipelas, in which endocarditis subsequently developed.

Dr. Duclos draws some practical conclusions, in regard to treatment, based upon the early recognition of the affection, and he believes that he has succeeded in arresting the disease, in certain cases, before irreparable injury had resulted. His plan is to apply immediately a large fly-blister over the præcordial region, or, in default of this, a mustard-plaster, dry cups, or leeches. He increases also the dose of the remedy that is being at the same time given for the rheumatism. Of course, a strict enforcement of recumbency is also indicated.

When we consider the importance of an early diagnosis of endocarditis, and the possibility of arresting the disease if detected in its incipiency, this alleged premonitory symptom of the affection is worth testing in order to determine the amount of practical utility that it may possess.—*Medical Record*, March 30, 1889.

THE THERAPEUTIC PROPERTIES OF HYSTERIONICA BAYLAHUEN.

Dr. G. Baillé reports in the *Bulletin Général de Thérapeutique*, February 28, 1889, the following conclusions from experiments made as to the therapeutic properties of *Hysterionica Baylahuen*. The infusion of this drug is an excellent remedy in diarrhœa, and has produced good results in both acute and chronic dysentery. It has likewise proved successful in diarrhœa of phthisical cases, and in the diarrhœa of various cachexias and cancer. The infusion may likewise be used during the employment of remedies, such as mercury, which tend to the production of diarrhœa. Given in alcoholic tincture, it does not produce constipation.

SOME EXPERIENCES WITH SULPHONAL.

Until quite recently the reports of the results of the use of sulphonal, the new hypnotic, have been decidedly in its favor. Of late, however, some accounts have come from abroad which indicate that it is not so harmless as was at first

asserted. This drug seems to be of so much value that exact knowledge of its effects is quite desirable. Its high price has probably prevented a very extensive use of it, and reports of its effects have so far been somewhat meagre.

Dr. C. M. Rexford's experience with sulphonal seems to show that it is about as well adapted to one class of cases as another, and that the only reason for expecting a failure in any given case is the presence of extreme pain (*Medical Record*, March 30, 1889).

The first patient upon whom its effects were observed was a woman who, from long-continued nervous strain, fell into a state of complete prostration, attended by intense cerebral congestion, non-inflammatory in character, with violent and constant headache, hallucinations, and finally delirium of a low type, lasting for months. This condition could only be controlled by opiates, and upon their withdrawal, which improvement made possible, it was succeeded by sleeplessness and much pain in the head. At this time sulphonal was put on the market. The first dose gave the patient a night of natural sleep, and the head felt much better the next day. No more perfect result could be desired than the drug produced in this case. A dose of 20 to 30 grains always produces sleep, relieves the distress in the head, and leaves no bad effect whatever. It has only been necessary to use the drug occasionally, and nothing like a habit has been formed.

The medicine was employed in a recent case of pneumonia. The attack was not severe; but the patient, a feeble woman, past middle life, was an extremely nervous and difficult one. Great depression of the nervous system came on, with persistent sleeplessness, which proved wholly refractory to ordinary sedatives. A dose of 10 grains of sulphonal was given. No effect, besides greater restlessness, was produced for four hours. Then profound sleep ensued, which persisted for twenty-four hours. During this time it was difficult to rouse her enough to take nourishment. No other ill result followed, nor did the insomnia return. The depth of the stupor produced by the small dose employed was such as to make the result of a larger dose seem rather doubtful. This patient has a weak heart, sometimes intermitting, but it seemed not to be affected by the drug.

Another case was one suffering from chronic metritis. This patient, when first seen, was extremely debilitated by absence of appetite and want of sleep. 15 grains of sulphonal at bedtime acted very favorably for a time, but finally failed to induce sleep, and only caused great restlessness instead. Finally, a second dose of 15 grains was given, four hours after the first. The patient then fell asleep. In the morning she was unable to rise. She complained of giddiness, of being unable to hold the head up, and could not stand or walk without assistance. There was vomiting, and the stomach refused to retain food for many hours. When permitted she slept a troubled, uneasy sleep for the whole day. It was not till the end of three days that she felt herself again. This patient also has a very weak heart, though there is no organic lesion. She is frequently faint, or is obliged to lie down because the heart acts badly. While under the influence of the medicine, as related, the heart-symptoms seemed to be made somewhat worse, but not notably so.

In the considerable number of other cases in which this remedy has been employed it has acted, in the main, favorably. These have been cases of nervous insomnia, and they have all yielded without any difficulty and with no untoward result.

The experience of the writer seems to indicate that sulphonal is a valuable medicine, but that it has its limitations. It is easy to take, it does not often irritate the stomach or produce ill effects. But it may fail to act as expected, and in some instances it may produce extremely disagreeable results. The dose which was at first recommended, of 30 to 60 grains, is too large to commence with. It is unsafe to give more than 10 grains as an initial dose, and 15 grains will prove a sufficient dose in the majority of cases.

ANTIPYRIN IN LARYNGISMUS STRIDULUS.

Dr. Montague Perceval, writing in the *Lancet* of November 17, 1888, recommends very highly the use of antipyrin in laryngismus stridulus. He reports the case of a child, 18 months of age, to whom he gave the drug in doses of 2 grains every hour for a few hours until the child fell asleep, and then in the same dose every two hours. The following day the little patient was well. The author used the remedy in twenty-three other cases with equally favorable results, except that in one case it was necessary to increase the dose to 5 grains before the paroxysm ceased.—*Medical Record*, March 30, 1889.

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PROPHYLACTIC HYGIENE.

LECTURE IX.—ON PASTEURIAN VACCINATIONS.*

By Professor Dujardin-Beaumetz, Paris, France.†

GENTLEMEN:—Nearly ten years ago (February 10, 1880) Pasteur announced to the Academy of Sciences that the virulence of the cultures of the microbe of chicken cholera could be made to undergo a progressive attenuation, and that the inoculation in the fowl of this attenuated virus confers immunity against any subsequent attack of the disease; he laid down this law, moreover, that each attenuated virus constitutes a vaccine for the virus less attenuated.‡

The year following (March 21, 1881) he made known in his own name and that of his collaborators, Chamberland and Roux, that it was also possible by special processes to attenuate the virus of charbon (splenic fever,

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

† Member of the Academy of Medicine, Physician to Cochin Hospital, etc., Paris, France.

‡ Pasteur, "On Virulent Diseases, and Chicken Cholera in Particular" (*Acad. de Méd.*, February 10, 1880); "On Chicken Cholera, and Exemption from Relapses, etc." (*Acad. de Méd.*, April 27, 1880); "Attenuation of the Virus of Chicken Cholera" (*Acad. des Sciences*, October 26, 1886).

wool-sorters' disease), and render animals refractory thereto; and the 5th of May of that same year took place that celebrated experiment at Pouilly-le-Fort, which demonstrated the reality of the facts advanced by Pasteur.*

The very same year (1881) Pasteur commenced his studies on canine rabies;† he showed that by similar processes the development of that disease might be effectually opposed in the dog and in man; and on the 6th of July, 1881, at eight o'clock in the evening, in the presence of Vulpian and Grancher, he applied this method to a boy by the name of Joseph Meister.

Such are the steps in the history of attenuated virus and resulting vaccinations,—a history which does such lasting honor to our illustrious fellow-countryman, whose name will be henceforth associated with this grand discovery,—a discovery which places Pasteur above Jenner, for, as I said in my first lecture, if the one made a discovery of genius, the other has created a method of genius.

But there is another man whose name ought not to be forgotten in connection with this discovery of attenuated virus. I refer to Toussaint. On the 12th of July, 1880, Toussaint communicated to the Academy of Sciences a memoir, in which he endeavored to show that by filtration, or by elevation of the temperature, one might create an attenuated virus, which would confer on animals immunity.‡ Toussaint maintained that the *bacillus anthracis* produced its infectious effects only by its soluble products, possibly certain alkaloids secreted by these micro-organisms. He was then the first to make known the possibility of conferring on animals immunity by the toxines secreted by the microbes,—a process of vaccination to which has since been given the name of chemical vaccines. He was the first, also, to show the influence of heat in attenuating the virulent properties of the anthrax-bacillus. I propose to take up to-day the principal points suggested by this great question of Pasteurian vaccinations.

When we take a general survey of all the processes which experimental physiology has at command for the obtention of these attenuated viruses, which are true vaccines, we see that they may be ranged in three great classes:

In the first, the attenuation results from modifications, impressed upon the vitality of the microbe. In the second, we no longer act directly on the micro-organism, but we obtain the attenuation by diminishing the number of the micro-organisms introduced, by modifying the mode of introduction, or by making the microbes pass through different organisms. Lastly, in a third group, we no longer direct our efforts to the micro-organism itself, but to the leucomaïne which it secretes, and here it is the chemical element which constitutes the preservative vaccine. Let us examine each of these groups.

We may by various means, by physical or chemical agents, modify the vitality of bacteria, and thus transform pathogenic microbes into saprogenous microbes, according to the expression of Chauveau.§ This transformation has given rise to important recent communications. Some believe with Bouchard that the microbe may secrete different ptomaïnes, some virulent, others vaccinal, and that we may succeed by physical and chemical agents in causing the first to disappear while preserving the second; such is not the opinion of Chauveau, who thinks that the vaccinal properties are due to diminution of the virulence proper to the pathogenic microbe.¶

It must be borne in mind that we have not yet a physiological explanation of the immunity conferred by these vaccines, and we may yet have to wait a long time before science will have said the last word on this vexed question: this is a subject which I have already touched upon under the head of infections and poisonings. We come now to the practical question how we may attenuate the viruses of infection by means of physical and chemical agents. We will begin, if you please, with the first.

The physical agencies which we may employ are heat, light, and desiccation.

* Pasteur, Chamberland, and Roux, "On the Attenuation of Virus, and its Return to Virulence" (*Acad. des Sciences*, February 28, 1881); "The Vaccine of Charbon" (*Acad. des Sciences*, March 21, 1881).

† Pasteur, Chamberland, Roux, and Thuillier, *Comptes-Rendus de l'Acad. des Sciences*, May 30, 1881, and December, 1882.

‡ Toussaint, "On Immunity from Charbon, conferred by Preventive Inoculation" (*Acad. des Sciences*, July 12, 1880, and July 18, 1881).

§ "On the Vaccinal Properties of Microbes before Pathogenic, transformed into Microbes of Saprogenic Appearance" (Chauveau in *Archives de Médecine Expérimentale*, etc., March, 1889, p. 161).

‖ Bouchard, "On the Attenuation of Virus" (*Acad. des Sciences*, February 25, 1889).

¶ Chauveau, "On Microbes previously Pathogenic which, to all Appearance have preserved only the Property of Vegetating Outside of the Living Organism. Can they Recover their Primitive Infectious Properties" (*Acad. des Sciences*, March 4, 1889).

Heat was one of the first agencies put in use for the attenuation of virus, and Toussaint,* as I have told you, was the first (on July 12, 1880) to call attention to this means of attenuating anthracoid blood, and to provide veterinary medicine with a real vaccine for charbon. This process consists in heating anthracoid blood, thoroughly defibrinated, to 55° C. (131° F.) for ten minutes, and in practising with three cubic centimetres of this blood subcutaneous injections. Toussaint, in operating on a sheep, obtained immunity by a single inoculation, and in three other sheep by two inoculations.

But it is to Pasteur that the honor belongs of having established on definite bases this attenuation of virus, and of having shown how the *bacillus anthracis* becomes modified under the influence of heat; already the previous year, while studying chicken cholera, he had shown that it was easy to attenuate cultures of the microbe of this disease by a process of *aging* (*vieillissement*), and that this loss of virulence went on gradually to complete inactivity. The organisms whose virulent properties have been thus attenuated transmit this attenuation to their descendants, so that you may at will constitute races of microbes of almost any degree of attenuation. As I shall tell you presently when I come to speak of oxygen, it is to the action of this agent and to that of light that we must attribute this attenuation. It is, then, under the guidance of these first researches that Pasteur undertook the attenuation of anthracoid virus.†

Pasteur and his collaborators, Chamberland and Roux, showed that at the temperature of 42° C. (107° F.) cultures of *bacillus anthracis* give rise to abundant tufts of mycelium (see THERAPEUTIC GAZETTE, October 15, 1888, page 652, Fig. 3), in which you no longer observe the development of spores. Above 45° C. (113° F.) the cultures are arrested. It is this mycelium of the bacillus anthracis, deprived of spores, which is susceptible of undergoing the action of oxygen and losing its virulent properties. We have here, as you see, a double action: the action of heat which modifies the culture of the bacillus anthracis and makes of it a species which develops without sporulation, and the action of oxygen which attenuates the virulence of the mycelia.

We thus obtain two vaccines: the one is a first vaccine which results from the sojourn of a culture of the bacillus deprived of spores in a stove where it is exposed to a heat of 45° C. (113° F.) for fifteen to twenty days; this vaccine does not kill hares and guinea-pigs, but it kills mice. The second vaccine is produced by a similar culture, which is allowed to remain in the stove only ten or twelve days; this vaccine kills mice and guinea-pigs, and renders the adult hare sick without killing it.

It was with such vaccines that on May 5, 1881, was made the celebrated experiment of Pouilly-le-Fort which you should always remember, for it was in consequence of this memorable experiment that this subject of attenuated virus first passed from the domain of the laboratory to that of practice. The Society of Agriculture of Seine and Marne, presided over by the Baron de la Rochette, decided that a test experiment should be made at a farm situated near Melun at Pouilly-le-Fort.‡ This experiment was begun May 5, 1881. Twenty-four sheep, a goat, and six cows were inoculated that day with the first virus; twelve days after a second inoculation was made with the second attenuated virus. On the 31st of May all these animals were inoculated with an extremely virulent virus, as well as thirty-two other animals that were to serve as tests.

The next day every one who participated in this experiment was on the ground to witness the result, and you may imagine the feelings of those present when they saw in the yard where were kept the animals which had not been inoculated, twenty-one dead sheep, and all the cows sick, while, on the other hand, all the animals that had been vaccinated resisted the infection.

The experiment was conclusive, and henceforth it was a settled fact that it was possible, by the method indicated by Pasteur, to protect our flocks from the pestilence which had been making such havoc among them; and I shall show you, when I come to speak of the practical consequences of the Pasteurian vaccinations, the results which we have attained to-day.

Light, as I have said, is one of the agents

* Toussaint, "On Immunity from Charbon acquired by Preventive Inoculations" (*Acad. des Sciences*, July 12, 1880).

† Pasteur, "On Chicken Cholera," "Study respecting the Conditions of Immunity," etc. (*Acad. des Sciences*, April 27, 1880); "On the Attenuation of the Virus of Chicken Cholera" (*Acad. des Sciences*, October 26, 1880).

‡ Pasteur, Chamberland, and Roux, "Report of Experiments made at Pouilly-le-Fort on Anthracoid Vaccination" (*Acad. des Sciences*, June 13, 1881).

of attenuation of virus, and in proof of this I need only appeal to the labors of Arloing. Arloing operated on the *bacillus anthracis;* he first tried gaslight, then sunlight, and showed the rapid destructive action of the latter, even on the spores of the bacillus. This attenuating influence is not due to the calorific rays, nor the luminous rays, but to the solar light in its entirety.*

This rapid action of the solar light on the spores of the *bacillus anthracis* has given rise to some interesting discussions. When I spoke to you of pathogenic microbes, I told you how resistant are the spores of this bacillus to our ordinary agents of destruction. The results to which Arloing arrived were in absolute contradiction to this statement. Hence we have seen doubts expressed as to the value of those experiments, and Nocard on the one hand, and Straus† on the other, take the ground that the solar rays act not on the spores but on the nascent mycelium, stimulating the germination, but rapidly destroying the new proliferation.

Arloing has since repeated the experiments of Straus, and has reaffirmed his first statements.‡ He believes that the solar light acts equally on the spores and on the mycelium, and even the mycelium is the more resistant especially when it is very young. Light is, then, one of the most powerful agents of destruction of the microbes, and enables us to obtain a rapid attenuation of anthracoid virus.

Desiccation is also a means of attenuation of virus, and this method, joined to that of heat, has been employed on two kinds of virus,—that of symptomatic charbon and that of rabies.

In my lecture on the pathogenic microbes, I told you that there are two species of charbon,—the one which attacks our sheep, the deadly anthrax, whose pathogenic microbe is the *bacillus anthracis;* the other is the symptomatic charbon, which makes such ravages among cattle, and is known by the name of *mountain plague* (*mal de montagnes*); its pathogenic microbe is the *bacterium Chauvei.* These two diseases are absolutely distinct, one might even say opposite.

Arloing, Cornevin, and Thomas, who have made a complete study of symptomatic charbon, and who have examined all the methods of attenuation of the *bacterium Chauvei*, have chiefly utilized in their method the employment of heat and of desiccation, and this is their mode of procedure. They desiccate in a current of dry air the anthracoid muscular pulp; they reduce to a powder the mass thus desiccated, moisten it, and subject the whole to a temperature of 100° to 104° C. (212° to 220° F.). At the end of seven hours they obtain a virus which is very much attenuated, and which may serve for a first vaccine. To obtain the second vaccine, they still make use of the dry pulp, and subject it for six hours to a heat of from 85° to 90° C. (185° to 192° F.). But it is in the attenuation of the rabic virus that the action of light, of temperature, and desiccation is especially brought into usage.

When Pasteur, in 1881, showed that it was in the nervous system that the virus of rabies localizes itself, thus transforming into scientific reality the hypothesis advanced in 1879 by Duboué, science was henceforth in possession of a method by which multiple and precise experimental researches might be made on canine rabies.§

Basing himself on the period of incubation, Pasteur established the principle that we may augment or diminish the virulence of rabies by causing the disease to pass through different organisms, and he also showed that it was possible to obtain for each animal a fixed virus. Street rabies, communicated from hare to hare, gives at the end of a certain time a virus which, by intracranial inoculation, causes the same disease to appear in seven days.

It is this fixed virus which Pasteur has attenuated, and which serves as the basis of his vaccinations. To obtain this attenuation, he put in operation processes which had already served him in other attenuations. As the

* Arloing, "Influence of Light on the Vegetation and on the Pathogenic Properties of the Bacillus Anthracis" (*Acad. des Sciences*, February 9, 1885); "Influence of Sunlight on the Vegetation of the Spores of Bacillus Anthracis" (Ibid., August 24, 1885); "Influence of Light on the Vegetation and Virulence of Bacillus Anthracis" (*Lyon Médical*, February 7, 14, and 21, 1886); "Influence of White Light and its Constituent Rays on the Development and the Properties of the Bacillus Anthracis" (*Archives de Physiologie*, 1886); "Destruction of the Spores of the Bacillus Anthracis by Solar Light" (*Acad. des Sciences*, March 7, 1887).

† Straus, "Note on the Action of the Solar Light on the Spores of Bacillus Anthracis" (*Soc. de Biol.*, November 6, 1886).

‡ Arloing, "Destruction of the Spores of Bacillus Anthracis by Solar Light" (*Acad. des Sciences*, March 7, 1887).

§ Pasteur, Roux, Chamberland, and Thuillier (*Acad des Sciences*, May 30, 1881, and December 11, 1882) Duboué, "On the Pathological Physiology and Rational Treatment of Rabies." Paris, 1879. "On the Progress accomplished in the Knowledge of Canine Rabies, and on the Part which Belongs to the Nervous Theory," 1887.

far it has been impossible to isolate the pathogenic microbe of rabies and to develop it in culture-broths, he chose the spinal cord as the most suitable infecting material to subject to the action of heat and of desiccation.

The method consists in suspending in glass jars, which are exposed to the rays of the sun, the spinal cords of hares which have succumbed to rabies, and these cords are there kept at a constant temperature of 20° C. (68° F.), and the air which penetrates these jars is desiccated by the agency of caustic potash. The virulence of these cords becomes gradually attenuated, so that at the end of seven days they can no longer communicate rabies. This attenuation, at first very feeble during the first two days, becomes more pronounced on the third day, then goes on increasing more and more.

Temperature has a very notable influence on the attenuation of virus. Gamaleia has shown that it suffices to elevate the temperature from 3° C. to 23° C. to cause the spinal cord to lose all its virulence in five days. Helman, of St. Petersburg, affirms that in twenty-four hours this virulence is lost, if you raise the temperature to 35° C. (95° F.).

Thanks to this combined action of dry air, of heat, of light, and of time, Pasteur was now in possession of a scale of more or less attenuated viruses, proceeding from the most inoffensive to the most active. It is this graduated scale which he employs in effecting his antirabic vaccinations, going gradually every day from the weakest virus to that which is most powerful. I cannot here enter further into this great question of antirabic vaccinations, and must refer you to the numerous treatises written on this subject, and especially to the work of Suzor.*

In the operation of all these physical agencies for the attenuation of virus, heat, light, desiccation, there exists an always constant factor,—namely, oxygen. In fact, from the time of his first researches on the attenuation of virus, Pasteur had shown that in the attenuation of the virus of chicken cholera, oxygen was the really efficacious agent, and the experiment which he performed to determine this is very demonstrative. He placed in two flasks some cultures of the micro-organisms of chicken-cholera, cultures made under similar conditions and in the same nutritive medium; he sealed hermetically the first flask, and plugged the second with cotton wadding. The culture in the flask hermetically sealed did not undergo attenuation, while that in the other flask, exposed to the free action of the air, became remarkably attenuated. But Chauveau is the authority who has most thoroughly studied the action of oxygen on the attenuation of virus, and he has made this the subject of several very interesting memoirs.†

These researches were made from 1883 to 1885, and pertained exclusively to the attenuation of anthracoid virus. He endeavored first to ascertain which was the most active agent, heat or oxygen. He proved that there are conditions in which heat and air favor, hinder, or prevent, the development of the *bacillus anthracis*. To the first of these conditions he gave the name *eugenesic;* to the second, the name of *dysgenesic;* to the third, that of *agenesic*.

He showed that at the agenesic and dysgenesic temperatures oxygen plays no part, at least in elevated temperatures. It is not so with low temperatures, and the presence of oxygen hastens the loss of virulence and the loss of the property of proliferation. But when you augment the pressure of oxygen, the action is much more energetic, and this is how Chauveau demonstrates this fact. He places a culture of *bacillus anthracis* in a recipient sufficiently resistant to withstand the pressure of eight atmospheres; Chauveau uses atmospheric air rather than oxygen. The temperature of the medium is maintained at 35° C. (95° F.). At the end of three weeks there is an attenuation of this culture, but it is still feeble, as it causes the death of half the sheep inoculated with it.

But if you make with this first culture already attenuated, another culture in the same conditions and under the same pressure, you obtain a virus more attenuated still, and you can easily succeed, by thus renewing these cultures, in making them undergo successive attenuations. The latter pertain not only to the virulent properties of the cultures, but also to their reproductive properties, and, as in Pasteur's method, each of these cultures thus attenuated is the starting-point of a

* Suzor, "A Practical Exposition of the Treatment of Rabies by the Method of Pasteur." Paris, 1888.

† Chauveau, "On the Rôle of the Oxygen of the Air in the Attenuation of Virulent Matters by the Action of Heat" (*Acad. des Sciences*, March 12, 1883); "On the respective Rôle of Oxygen and of Heat in the Attenuation of Anthracoid Virus by the Method of Pasteur" (ibid., May 21, 1883); "On the Nature of the Transformations which the Blood of Splenic Fever undergoes by Culture in Compressed Oxygen" (ibid., July 13, 1885).

species of microbe whose vegetation and proliferation are henceforth fixed.

Chauveau affirms, even, that his process is much superior to that of attenuation by heat. Hence he has substituted in practice his method for that heretofore employed. This superiority results, he thinks, from the resistance which the cultures attenuated by compressed air present to the ordinary causes of age and decay. These cultures preserve their vaccinal properties for several months, and this period is the longer the more pronounced the attenuation. In the case of the vaccinal virus employed for sheep, this conservation holds good for three months.

By the side of oxygen we would place all chemical substances capable of modifying the vitality of these microbes, and it is an interesting fact that Chamberland and Roux have shown that most antiseptic substances have the property of attenuating the *bacillus anthracis*. Here are some of the facts brought out by their researches:

When we employ phenic acid in modifying culture-broths, we observe that in the strength of 1 per 800 it does not sensibly impede the development of *bacillus anthracis*, but, on the other hand, the proportion of 1 per 400 destroys all vegetation in forty-eight hours. But if we take the mean of these figures and add to a culture-broth of 35° C. (95° F.) carbolic acid, in the proportion of $\frac{1}{600}$, we obtain a culture deprived of spores and sufficiently attenuated.

Chamberland and Roux also showed that the culture-broth has a real importance in these cases, and that if, for instance, we substitute distilled water for the culture-broth, this same proportion of 1 per 600 of phenic acid entails the rapid death of the *bacillus anthracis*, and it is necessary to lower the proportion to 1 per 900 in order to obtain, in distilled water, the same attenuation that 1 per 600 produces in the ordinary broth.*

Arloing, Cornevin, and Thomas have, in their turn, studied with great care the action of antiseptics on the attenuation of the *bacterium Chauvei*. They have brought out this important and interesting fact that antiseptics act differently on each of the microbes which we wish to attenuate, and that it is impossible *a priori* to establish a law applicable to the attenuation of the different micro-organisms, and this is their conclusion: "It is possible, by properly grading the strength of certain antiseptic solutions and determining the proportions according to which these antiseptic substances should be associated and the duration of the contact, to prepare vaccines by the aid of which we may succeed in practising prophylactic inoculations."

To the long list of antiseptic substances experimented with by Arloing, Cornevin, and Thomas for the attenuation of symptomatic charbon, Nocard and Mollereau have added oxygenated water.† Gamaleia has applied to the attenuation of anthracoid virus the bichromate of potash, and it is thus that the vaccination for charbon has been practised in Russia.‡

Maximovitsch§ has studied the action of the naphthols on this same virus, and his experiments have brought to light this curious fact, that the naphthol α in the proportion of .3 per 1000 and the naphthol β in the proportion of .6 per 1000 destroy the vegetation of the *bacillus anthracis* in from fifteen to twenty minutes; but in order to destroy all virulence, five or six days of contact with the same solutions are needed. Hence, then, the vegetation of this bacillus and its virulence are at different points of the scale.

Maximovitsch has also caused these naphthols to act upon the pyocyanic bacillus, and he has shown, as in the case of the anthracoid virus, that it is necessary to distinguish in their antiseptic action the effects on vegetation from those on virulence. More recently, Grancher and Chautard have shown that if hydrofluoric acid does not destroy the bacillus of tuberculosis, it attenuates its effects; they have not, however, constituted a veritable vaccine with these bacilli.‖

Lastly, we ought to include among these facts the recent experiments of Manfredi,¶ who, in adding fatty matters to the culture

* Chamberland and Roux, "On the Attenuation of the Virulence of the Anthracoid Bacteria under the Influence of Antiseptic Substances" (*Acad. des Sciences*, April 9, 1883); "On the Attenuation of the Anthracoid Bacteria and its Germs under the Influence of Antiseptic Substances" (ibid., May 14, 1883).

† Nocard and Mollereau, "On the Employment of Oxygenated Water as a Means of Attenuation of Certain Viruses" (*Bull. de l'Académie de Médecine*, January 2, 1883).

‡ Gamaleia, "A Study of Anthracoid Vaccination" (*Annales de l'Institut Pasteur*, 1888, No. 10).

§ Maximovitsch, "New Researches in the Naphthols" (*Acad. des Sciences*, May 14, 1888).

‖ Grancher and Chautard, "Influence of the Vapors of Hydrofluoric Acid on the Bacilli of Tuberculosis" (*Annales de l'Institut Pasteur*, 1888, No. 5).

¶ Manfredi, "On Excess of Fat in the Alimentation of Pathogenic Micro-Organisms as a Cause of the Attenuation of their Virulence" (*Giorn. internez del scienze Mediche*, 1887).

media of *bacillus anthracis*, noticed that these fatty matters modified the culture and produced an attenuated virus. If there are chemical substances which attenuate virus, there are others, on the contrary, which exalt the virulent properties of virus, and I can give you a good instance of this in the effects of lactic acid on the virus of symptomatic charbon. Arloing and Cornevin have shown that you double its virulence by putting it in contact with one-fifth part of lactic acid. Viruses attenuated by other methods regain their first virulence when you bring them into contact with lactic acid. We have here an important fact, which shows that we may find in a same series of bodies substances which augment or enfeeble the virulence of the pathogenic microbes.

I pass now to the second group of means which may be put in operation for the attenuation of virus.

Here no attack is made on the vitality of the pathogenic microbe, but the attenuation is obtained either by introducing a very limited number of micro-organisms into the economy, or by modifying the mode of introduction, or in causing the microbe to pass through different organisms.

When I spoke of immunity, I mentioned the experiments of Chauveau, which showed that it was possible by introducing a very small number of the *bacillus anthracis* into animals to confer on them immunity. I shall not return to this point, and shall refer you to the very important memoir which Chauveau has just published, "On the Vaccinal Properties of Attenuated Virus." *

But I desire to dwell a little longer on the immunity acquired by the part of the body where the inoculation is practised. I shall choose my examples in the attenuation of the virus of symptomatic charbon and from canine rabies.

Arloing, Cornevin, and Thomas have shown that the mode of introduction of the *bacterium Chauvei* modifies considerably the effects of this microbe. Thus, when you inject this microbe into the blood, you produce discomfort and uneasiness for two or three days, but the animal does not succumb, and this injection confers immunity. This was, indeed, the first process of vaccination counselled by experimenters.

But as this process often gives rise to accidents, another method has been substituted, which consists in inoculating animals at the extremity of the tail, and this method is still employed to-day.

As for canine rabies, we find similar facts in connection with this malady, and we can, according to the mode of introduction, augment or attenuate the virulence. While the incubation is long and uncertain when the virus is inoculated under the skin, this incubation diminishes considerably when the inoculation is made directly into the brain. To conform to objections which have been made to this method of intracranial inoculation, some have recourse to-day to a process quite as rapid, and which produces no traumatism,—namely, the inoculation of the virulent matter into the anterior chamber of the eye, according to Gibier's process.

Such are the means for augmenting the virulence of rabies by the mode of introduction; but we may also attenuate its effects by injecting the virus into the blood, and a certain immunity may be obtaind, as Galtier has shown, by injecting into the veins of animals (as sheep and goats) the saliva of a mad dog.†

When you cause a virulent disease to pass from one organism to another, you either exalt or diminish its virulent properties, and you may be able by taking this altered virus from animals to obtain a preservative vaccine.

We come now to the third group which we have established,—namely, to the methods of vaccination,—where we employ not the microbe itself, but the culture liquids in which it is developed.

As I told you at the beginning of this lecture, it is to Toussaint that we are indebted for the first notion of this mode of vaccination.‡ In his communications made in 1880 and 1881 to the Academy of Sciences, Toussaint stated that he had obtained immunity from charbon by injecting in animals blood serum thus prepared. He took anthracoid blood, defibrinated it by whipping, then filtered it through ten or twelve thicknesses of filtering-paper; this liquid was thus deprived of bacilli, and the results obtained by injecting it gave support to the hypothesis put forth by him, that the *bacillus anthracis* produces its noxious effects, not by its own pres-

* *Archives de Médecine Experimentale*, p. 161, March

† Galtier, *Compt.-Rendus de l'Acad. des Sciences*, August 1, 1881.

‡ Toussaint, "On Immunity from Charbon acquired by Preventive Inoculations" (*Acad. des Sciences*, July 12, 1880); "On Certain Points Relative to Immunity from Charbon" (ibid., July 18, 1881).

ence, but by the toxic products which it secretes. Unfortunately, as Pasteur showed, this filtration was incomplete, and let a certain number of bacteria pass through, so that the whole subject remained in the state of conjecture. The same hypothesis had already been advanced by Pasteur, who showed in 1880 the possibility of explaining the immunity by assuming the action of certain products secreted by the microbes. Chauveau, the same year, accepted the same hypothesis.

All these experimental researches were destined to be taken up again in 1887. But I ought to mention in this connection a work which has not been cited in the very complete history which Bouchard has given of this subject in his fine treatise "On the Therapeutics of Infectious Diseases."* This brochure, which is anonymous, appeared in 1886, and bore the title, "The Immunity conferred by Leucomaïnes."

The writer, who signs himself E. G. B., after having criticised all the works before published on attenuated virus, vaccines, and immunity, comes to the conclusion that it is the leucomaïnes secreted by the pathogenic microbe which, by entering the organism, confer immunity, whether this be owing to the penetration of the economy by the microbe, or to the introduction for vaccinal purposes of the leucomaïnes in the filtered products of the culture-broth.

The unknown writer, however, takes the part of a critic, not of an experimenter. But we shall see that from 1887 onward, experiments in this direction became more and more numerous and demonstrative, and that they establish the reality of vaccination by soluble matters.

In January 27, 1887, Pasteur, in a letter addressed to Duclaux, and published in the first number of the *Annales de l'Institut Pasteur*, under the head of "Canine Madness," admits that in the rabic rhachidian bulb (or spinal marrow) there are two things,—the virus and the vaccinal matter, thus separating the virulent from the vaccinal properties.

The same year, in the month of September, Salmon and Smith reported to the Medical Congress at Washington the results which they had attained, and showed that culture-broths of chicken cholera, freed from all micro-organisms by heat, confer immunity on fowls; these researches date from the years 1885 and 1886.

In the month of October, 1887, Charrin, in communications made to the Academy of Sciences, demonstrated the same fact with reference to the *pyocyanic bacillus*, and when you inject under the skin of the hare a filtered culture of this microbe, you confer on the animal immunity against intravenous injections of the infectious liquid.

It was still in the same year, 1887, that Peyraud,† of Libourne, communicated to the Society of Biology his curious experiments on tansy and the convulsive phenomena which it determines in animals. He endeavors to show that these phenomena resemble those of canine madness. He gives to this kind of poisoning the name of *tansy madness*, and maintains that by injecting this substance under the skin, you may confer on animals immunity from street rabies. Peyraud also labors to find the leucomaïne of rabies, and compares the rabic poison to the essence of tansy.

Lastly, Roux and Chamberland published in November, 1887, their important researches on gangrenous septicæmia, and showed that culture-broths of the septic vibrio injected in animals confer immunity from septicæmia. Chantemasse and Widal also made known in February, 1888, that it was possible by the leucomaïnes secreted by the bacillus typhosus to confer immunity against typhoid infection. Lastly, Gamaleia, of Odessa, affirmed, in January, 1888, the same fact in regard to cholera. Charbon itself, according to the experiments of Roger, belongs to the group of infectious diseases from which immunity may be attained by the employment of a chemical vaccine obtained from the culture liquids.

As you see, this question of chemical vaccines tends to become more and more important every day.

How are we to explain this curious action of the leucomaïnes secreted by the microbes in conferring immunity on animals?

Must we, as Bouchard believes, separate the vaccinal from the virulent properties? Must we, on the other hand, assume that the same chemical substance is at once vaccinal and virulent, and if it renders the organism refractory to subsequent inoculations, it is because the animal is, as has been said, *mithridatized*,‡ that is to say, because the economy has become habituated to and proof

* "Therapeutique des Maladies Infectieuses." Paris, 1889.

† Peyraud, "On Immunity by Chemical Vaccines." Paris, 1888.

‡ An acquired tolerance of poison.—[Tr.]

against the toxines secreted by the pathogenic microbe?

These are questions of great importance which are far from being solved, and the discovery of chemical vaccines is of too recent date to warrant us in expecting any very immediate explanation, despite the ardor of the researches undertaken in this direction. However, this may be, we must admit, as demonstrated to-day, the reality of these chemical vaccines, and it is probable that this subject will soon pass from the domain of the laboratory to that of practice.

Let us examine now what practical results have been furnished by the Pasteurian vaccinations; we will consider them chiefly in connection with two diseases, anthrax in domestic animals, and rabies in man.

As for anthrax, we have demonstrative figures furnished by Chamberland to the Congress of Vienna. In reply to the opponents of the anthracoid inoculations who objected that these inoculations give no practical results, Chamberland furnished the following statistics:

RESULTS OF ANTHRACOID VACCINATIONS.

SHEEP.

	Animals vaccinated.	Mortality during vaccination. Per cent.	Mortality after vaccination. Per cent.
1882.....	243,199	.65	.45
1883.....	193,119	.36	.41
1884.....	231,693	.47	.50
1885.....	280,107	.57	.33
1886.....	202,064	.46	.29
Average...	.....	.50	.40

HORNED CATTLE.

	Animals vaccinated.	Mortality during vaccination. Per cent.	Mortality after vaccination. Per cent.
1882.....	21,916	.15	.....
1883.....	20,501	.09	.20
1884.....	22,616	.15	.22
1885.....	30,428	.19	.14
1886.....	22,376	.11	.17
Average...	.....	.14	.19

These figures are eloquent, and show that in their application to practice, the Pasteurian vaccinations give remarkable results, and that they are destined to become more and more general.

But the question which most interests us is, that which pertains to canine madness and hydrophobia; this is the first practical application to man of the Pasteurian vaccination.

Let us see, first, what was the mortality of [illegible] before Pasteur's method came into use. The figures are very variable. Thus, according to Gowers, the mortality was forty to fifty per cent. of persons bitten; according to Renault, thirty-three per cent.; Bouley places the figure at forty-seven per cent.; lastly, Leblanc gives it as sixteen per cent. If you take as correct the lowest of these estimates, and this is probably nearest the truth, you will be obliged to admit that the results obtained by Pasteur's method are most gratifying.

Having been for several years commissioned by the Council of Hygiene and Salubrity of the Department of the Seine to examine into the cases of hydrophobia there occurring, I have in successive reports communicated the facts given below. Thanks, on the one hand, to the accurate lists kept by the commissaries of the police, who make a record of all persons bitten by mad dogs, and, on the other, to the registers of the Pasteur Institute, it has been an easy matter to obtain absolutely reliable statistics of the past two years.

In 1887, three hundred and six persons presented themselves at the Pasteur Institute; they are classed as follows:

Sixty-four had been bitten by animals which had been experimentally proved to be victims of rabies; one hundred and ninety-nine by animals whose madness had been attested by veterinary surgeons; forty-three by animals concerning which we could get no definite information.

Of these three hundred and six persons there have died: two in 1887; one in 1888. This gives a mortality of .97 per cent., or 1.14 per cent. if you take into account only the two hundred and sixty-three persons bitten by animals known certainly to have been mad.

During the same year, there were forty-four persons bitten by rabid animals who were not brought to the Pasteur Institute; out of this number there were seven deaths, giving a mortality of 15.90 per cent.

The statistics for 1888 are as follows:

Three hundred and eighty-five persons presented themselves at the Pasteur Institute. Of these, one hundred and five had been bitten by animals whose madness had been experimentally demonstrated; two hundred and thirty-one by animals which had been pronounced victims of rabies by veterinary surgeons; forty-nine by animals concerning which we had no definite information.

These three hundred and eighty-five persons have furnished a mortality of five,—four in 1888 and one in 1889; this gives a percentage of 1.29, and, if you take into account

only the three hundred and thirty-six persons bitten by dogs known to be mad, you have a mortality of 1.49 per cent.

During the same year, there were one hundred and five persons bitten by mad dogs who did not present themselves at the Pasteur Institute; of these, fourteen died, giving a mortality of 13.3 per cent.

To sum up, the mortality in persons not treated by Pasteur's method was 15.90 per cent. in 1887, and 13.36 per cent. in 1888. These figures, as you see, come very near to those given by Leblanc. Among those treated by preventive inoculations who had been bitten by dogs concerning whose madness there was no doubt, the mortality was 1.14 per cent. in 1887 and 1.49 per cent. in 1888. It is then plain that the benefits of the Pasteurian treatment are indisputable, since the mortality is brought down from an average of fifteen or sixteen per cent. to about one per cent.

These results have not pertained exclusively to the Institute Pasteur. Recall to mind, in this connection, the discourse pronounced by Grancher at the inauguration of the Institute Pasteur. You will there find statistics which agree absolutely with those which I have just given you, and you will see that the mortality for the totality of individuals who presented themselves at the Pasteur Institute in 1886 was 1.34 per cent., and in 1887 1.12 per cent. Moreover, Pasteurian institutes are being established in other countries, and we may reckon as many as twenty in the entire world. At Odessa, under the direction of Gamaleia, the mortality was 1.11 per cent. in 1886, 1887, and 1888; at Moscow, it was 1.27 in 1887 and 1.60 in 1888; at Naples, it has been 1.5, and in Havana, 1.6.

We may, then, conclude from past experience that wherever the Pasteurian method has been carried out, the mortality has fallen, on an average, to about 1.5 per cent. This is an unquestionable gain, and we cannot too much emphasize these figures when in the presence of those who gainsay Pasteur's method.

When, instead of applying the antirabic inoculations to man, animals are made the subjects of these inoculations, the results are still more conclusive. In the experiments made by Pasteur we find facts like the following: He takes fifty dogs, on which he performs the preventive inoculations, fifty other dogs serving as tests. When the Pasteurian treatment is finished, he inoculates these hundred animals with street rabies by intracranial inoculation. The fifty that were not inoculated all succumb; not one of the others becomes rabid.

This is not all. One may even arrest, in animals as in man, the commencing development of rabies experimentally induced by employing the preventive inoculations. But here, as in the case of man, there is always a certain mortality.

I might pursue this subject considerably further, but I think that I have sufficiently shown you the benefits which medicine is likely to derive from the vaccination methods discovered by our illustrious fellow-countryman. The era of vaccinations has but just begun, and everything warrants the expectation that in proportion as these preventive methods are perfected, they will constitute one of the principal elements for the preservation of man and of animals from infectious diseases.

BICARBONATE OF SODIUM AND BICHLORIDE OF MERCURY IN THE TREATMENT OF YELLOW FEVER.

By Geo. M. Sternberg, Major and Surgeon, U.S.A.

In a "preliminary note," published in The Therapeutic Gazette of August 15, 1888, the writer gave the results of a mode of treatment suggested by himself while in Havana last year. The cases referred to in this note were treated at the Garcini Hospital by Dr. Raphael Weiss, to whom I am indebted for clinical histories of twelve successive cases treated without a single fatal result.

The object of the present paper is to record the results of a more extended trial of the same treatment during the recent epidemics at Decatur, Alabama, and at Jacksonville, Florida.

Upon my arrival in Decatur, in the early part of October last, I found that yellow fever of a most malignant type was prevailing, and that the mortality had been very great even under the most favorable conditions as to nursing and surroundings. This is shown by the fact that out of ten physicians practising in the infected area, nine had yellow fever and five died. The one who escaped, Dr. B. F. Cross, had suffered an attack during a previous epidemic in the same place (1878). Soon after my arrival I called attention to the alkaline and bichloride treatment, and, in view of the very unsatisfactory results which had been obtained by other method the physicians remaining on duty, two

whom were recent convalescents, one after another adopted the treatment. Since the termination of the epidemic they have kindly given me a statement of the results obtained and more or less complete clinical histories of their cases.

The formula originally prescribed by me, as published in my preliminary note in the THERAPEUTIC GAZETTE, was adhered to. This is as follows:

℞ Sodii bicarb., grammes x (grs. 150);
Hydrarg. chloridi corrosiv., centigrammes ii ($\frac{1}{10}$ gr.);
Aquæ puræ, litre 1 (1 quart). M.
Sig.—50 grammes (about 1¾ oz.) every hour; to be given *ice cold.*

RESULTS OF TREATMENT IN DECATUR.

Treated by	Whites.			Colored.		
	M.	F.	Died.	M.	F.	Died.
Dr. B. F. Cross.....	13	7	2	2	2	0
Dr. E. J. Conyngton.....	5	3	1	1	2	0
Dr. E. M. Littlejohn.....	3	...	0	9	7	0
Dr. W. C. Buckley.....	1	...	1	5	4	0
Total.....	22	10	4	17	15	0

I have excluded from the above tabular statement two cases treated by Dr. Cross, in which the treatment was not commenced at the outset of the attack. One of these, a white male, terminated favorably; the other, a white female, resulted fatally. Dr. Cross remarks, with reference to the last-mentioned case: "She was taken sick on the 29th of September and died November 10. Was not put on the Sternberg treatment until the latter part of her illness."

The two fatal cases in the practice of Dr. Cross were: No. 1, Mr. J., aged about 30, taken sick October 18. Died October 23 after suppression of urine and black vomit. No. 2, Mrs. D., a feeble woman of 58 or 60, who had recently lost her husband from the same disease.

The fatal case in Dr. Conyngton's practice was: Captain K., "aged about 50 years; a large, plethoric man, rather a heavy drinker; had been in the habit of drinking whiskey for thirty years." This patient had suppression of urine on the fourth day of sickness.

The fatal case treated by Dr. Buckley was: Mr. B., aged 33. "The patient had a severe case of yellow fever, but was doing well, considering the severity of his case, until the morning of the seventh day, when he was found much worse. . . . It was ascertained that the family gave him a hearty meal on the sixth day,—the one previous to his becoming worse."

Through the kindness of Dr. Jerome Cochran, State Health Officer, I have received the following official statement of the number of cases and deaths in the Decatur epidemic:

Whites: { Cases, 97. Deaths, 30. } Colored: { Cases, 57. Deaths, 5. }

This gives us a general mortality of 29.22 per cent., and a mortality among the whites alone of 30.92 per cent.

Reference to the above table will show that in a total of sixty-four cases treated by the alkaline and bichloride method the mortality was only 6.45 per cent., and that the mortality among the whites, considered separately, was 12.5 per cent.

A just comparison, however, requires that we shall deduct the number treated by the method under investigation from the total number of cases occurring during the epidemic. This leaves us sixty-five whites with twenty-six deaths, and twenty-five colored with five deaths, treated by other methods; and gives a mortality of forty per cent. among the white and twenty per cent. among the colored population; whereas, under the alkaline and bichloride treatment not a single death occurred out of thirty-two cases among the colored population. Many of the cases were bright mulattoes—and the mortality among the whites was reduced to 12.5 per cent.

RESULTS OF TREATMENT IN JACKSONVILLE, FLORIDA.

My "preliminary note" in the THERAPEUTIC GAZETTE was brought to the attention of some of the physicians in Jacksonville during the recent epidemic, and I am informed that a number of physicians employed the treatment referred to, and that it gave general satisfaction to those who adopted it. I have as yet only obtained a detailed report from two physicians; but as these reports include a considerable number of cases treated in the Sand Hills Hospital by Dr. Sollace Mitchell, and in private practice by Dr. A. J. Wakefield, they may be taken as fairly representing the general results obtained by this method of treatment during the Jacksonville epidemic.

Dr. Mitchell writes me as follows:

"JACKSONVILLE, FLA., September 9, 1889.

"G. M. STERNBERG, M.D., BALTIMORE, MD.:

"MY DEAR DOCTOR,—I send you to-day a list of all cases treated upon the bichloride

and alkaline treatment; also those upon the triturated bichloride without the alkali. I confess my surprise at the great difference in mortality. I knew that my results with the alkali were far better than without it, but did not realize the great difference until I made out these lists for you. Some of the ages have been approximated because the book containing the ages, reception, etc., of many has been lost or mislaid. I treated in all two hundred and sixteen cases. I did not begin the use of the bichloride until I had treated some thirty-five or forty by other methods, and when the bichloride was begun only every fourth patient was put upon it, then every other patient, and towards the last almost all patients were put upon it [*i.e.*, the alkaline and bichloride treatment.—G. M. S.]. Cases were chosen by rotation as they came in, different treatment being used in different wards. The bichloride and alkali gave the best results by all odds.

"Most sincerely yours,

"SOLLACE MITCHELL."

The lists transmitted by Dr. Mitchell give the name, age, color, sex, and result, with a remark as to the severity of each case.

The list of those treated by the alkaline and bichloride method includes one hundred and six cases with five deaths,—a mortality of 4.7 per cent.

Seventy-nine of the cases and all of the deaths were whites,—a mortality of 6.3 per cent. Twenty-seven cases were colored, with no deaths.

Of the whites, seventy-three were males and six females. The deaths all occurred among the white males, and the mortality among this class, considered separately, was 6.8 per cent. This is certainly a very unusual result, and brings out in a very striking manner the value of this mode of treatment. Yellow fever is well known to be especially fatal among adult males, and in hospital practice a mortality of less than twenty-five per cent. among this class of cases is exceptional.

The mortality lists published in the newspapers during the Jacksonville epidemic gave the impression that the epidemic was of an unusually mild character. But it must be remembered that these lists related to the population generally, and included a very large proportion of the colored race, who remained in the infected city, while a large share of the white population left it upon the outbreak of the epidemic. Now, the mortality from this disease among negroes is always small, and is estimated by Dr. Mitchell not to have been over two per cent. in the Jacksonville epidemic. Yet the general mortality, as shown by the daily reports published in the newspapers, was in the vicinity of ten per cent. Dr. Mitchell estimates the mortality among the white population, considered separately, as from twenty-two to twenty-five per cent., but has not yet been able to give me the exact figures. This estimate includes both sexes and all ages, and if adult males were considered separately it would no doubt be considerably more than this. With two or three exceptions, the seventy-nine whites included in Dr. Mitchell's list were adults; one only was a child of 8 years; ten were between 15 and 20; twenty-five, from 20 to 30; twenty-nine, from 30 to 40; eleven, from 40 to 50; and three, from 50 to 60.

The cases are classified by Dr. Mitchell, as to severity, as follows: "Mild," forty-six; "severe," nineteen; "very severe," fourteen. It must be remembered that the treatment was commenced at the outset, and the mildness of the attack in those cases classified as "mild" may have been due to some extent to the favorable influence of the medicine administered. Indeed, the general result indicates that such was the fact. It is well known to those physicians who have had an extended experience in the treatment of yellow fever that many cases which appear to be mild at the outset in the end terminate fatally, and especially so in adult males, among whom the tendency to suppression of urine seems greater than in the case of females and children.

One of the principal objects which I had in view in prescribing full doses of bicarbonate of sodium, at regular intervals, was to neutralize the very acid condition of the urine, in the hope that it might be secreted more abundantly and with less injury to the renal parenchyma. The results attained seem to indicate that such is the case, and that the favorable action of the medicine is largely due to this fact.

Dr. Weiss, in transmitting the clinical notes of twelve successive cases treated in the Garcini Hospital, in Havana (in 1888), without a death, says:

"The urine has always been abundant. In some cases the density was lowered, but was compensated by a large quantity of urine. Albumen did not appear in some of the cases, in others the amount was small, and in others it reached two grammes to the litre. The albumen has always disappeared on the second or third day, and then the fever ceased."

Dr. Conyngton, of Decatur, remarks:

"One point of special note was that patients on this treatment in my hands never had any symptoms of suppression of urine, but rather the quantity was increased; while, on the other hand, in patients treated by the expectant plan, with diuretics, the urine was scanty, and those that died (three in number) died of suppression."

Dr. Sollace Mitchell, in a letter dated February 1, speaks of the "marked effect of the treatment" in diminishing the albumen and preventing in a great measure suppression of urine.

Dr. A. J. Wakefield, of Jacksonville, has given me a list of eighty-nine cases treated by himself during the recent epidemic in that city. Of these cases seventy-five were white and fourteen colored. Five deaths occurred among the whites,—a mortality of 6.6 per cent. Thirty-nine of the white cases were males and thirty-six females. Forty-one of the cases are classed as severe and forty-eight as mild. One of the fatal cases is said to have been a consumptive; one to have been convalescent and to have died from imprudence; in another the remark is made, "bad nursing and imprudence;" another, "unfavorable surroundings."

RESULTS OF TREATMENT AT RIO DE JANEIRO.

My friend, Dr. Robert Cleary, an American physician practising in Rio de Janeiro, in a letter dated December 13, 1888, gives me an account of four cases treated by this method; three made a good recovery and one died. The fatal case assumed a severe form from the outset, and was attended with hemorrhage from the vagina. Black vomit and suppression of urine occurred on the fourth day. Dr. Cleary thinks that in this case no treatment would have been of any avail, and says, in conclusion, "Should any new cases present themselves to me I shall continue using your method, as I believe in it."

I have recently received a clipping from the *Journal of Commerce* of Rio de Janeiro, containing a note from Dr. Rocha Faria, Inspector of Hygiene, in which the formula prescribed by me is given and strongly recommended. Dr. Faria says, "Some physicians who, during the present epidemic, have followed this treatment have obtained magnificent results."

The question arises as to whether the favorable results which have thus far attended this mode of treatment are due to the alkaline element of the treatment, or to the antiseptic element, or to the combined action of the two ingredients.

My principal object in suggesting the formula was to test a decidedly alkaline treatment from the outset of the attack, with a view to relieving the gastric distress and acid vomiting which is a prominent feature in cases treated by the expectant method; and also to render the highly-acid urine neutral or slightly alkaline, in the hope that the secretion would be more abundant and the tendency to suppression diminished. The treatment appears to meet these important indications; and, without in any sense being "specific," to save life by preventing those structural changes which give rise to passive hemorrhage from the stomach and suppression of urine,—two symptoms which present themselves in a majority of the fatal cases.

Bichloride of mercury in a comparatively small amount was added to the formula, not with the idea that it would to any extent destroy pathogenic micro-organisms in the intestine, but as an antiseptic which might be useful in preventing fermentative changes in the stomach, which would perhaps be favored by the free administration of an alkali. The idea has also occurred to me that the specific germ may possibly find a suitable nidus in the acid secretions of the stomach, and in this case the administration of an antiseptic in combination with an alkali would be the most rational treatment. Still, I have not given much weight to this idea. In my "preliminary note" I say, "I am rather disposed to attribute the favorable course of the disease to the full alkaline treatment than to any antiseptic effect of the bichloride in the intestine. In the stomach, however, I should expect a decided antiseptic effect from the medicine as administered, and perhaps this is, after all, what is most needed." I insist upon this point because the treatment has frequently been referred to by those who have used it as the "bichloride treatment." From my point of view it is essentially *an alkaline treatment*, with the addition of a certain amount of the bichloride of mercury as an adjuvant to meet certain indications, but which is not administered with the expectation that, by virtue of its germicide power, it may prove a specific in this disease.

Bichloride of mercury has, however, during the past year been administered in considerably larger doses than I have prescribed in the above formula, with the express purpose of destroying pathogenic micro-organisms in the intestine. This treatment was proposed

by Dr. Paul Gibier during his stay in Havana last year, and has been fairly tested by Dr. Vincent de la Guardia, in his wards in the charity hospital of this city.

The idea that the specific infectious agent of yellow fever may, as in cholera, have its habitat in the alimentary canal, has been forced upon the writer by his failure to find it in the blood and tissues of those suffering from the disease. Dr. Gibier has been led to a similar inference, and has even claimed the discovery of a bacillus which, as we think upon insufficient evidence, he supposes to be the specific infectious agent in question. The treatment proposed by him is based upon this idea, and consists in the free administration of purgatives for the purpose of clearing the pathogenic microbes out of the intestine, and of bichloride of mercury in large doses for its germicide effect. So far as the purgation is concerned, experienced physicians in the yellow fever zone generally agree that it is important to clear out the bowels with a brisk purge at the outset of the attack; but it is also established by experience that active medication of this kind after the first or second day of an attack is likely to do more harm than good, and, in fact, is a dangerous procedure.

I quote from the paper of Dr. de la Guardia, published in the *Crónica Médico-Quirurgica*, of Havana, as follows:

"We have been constant in giving the patients the series of purges recommended; the first day a saline cathartic,—45 grammes of sulphate of sodium; the second day, 45 grammes of castor oil in emulsion, with an equal quantity of syrup; and, finally, on the third day, 1 gramme of calomel, to which we added 1 gramme of jalap to make it more active,—given in two doses at an interval of one hour. The saline purge was frequently rejected by vomiting, and this also happened sometimes with the castor oil,—not so with the calomel, which is generally tolerated. During the period of large evacuations we invariably made use of the mercurial medication; using a draught composed of 5 centigrammes of bichloride of mercury, 30 grammes of brandy, and 120 grammes of sweetened water. Some patients rejected this by vomiting immediately after taking it. The patients were made to take this until the seventh, or, in some cases, the eighth day; at this time the favorable or unfavorable result was decided. During his illness the patient was given a large quantity of liquid in the form of chlorhydric lemonade (2 to 1000) iced. This was well retained by the stomach. Milk was the only food allowed,—generally iced. In some of the most severe cases the purgatives were again commenced. Certain symptoms were treated by special measures, in accordance with general principles. Vomiting, for example, was treated by the application of a blister to the epigastrium, and the patient was allowed to swallow small pieces of ice, Rivier's draught, etc. Hemorrhage was treated with ergot, and adynamia by tonics. The bichloride of mercury has rarely given rise to stomatitis, and when this has happened it has been mild in character and has been rapidly cured with simple emollient washes, or with chlorate of potassium.

"Thirty-seven cases were submitted to the mercurial treatment, all of them typical cases of yellow fever, in Saint Margaret's Ward of the Civil Hospital. Of these twenty-two recovered and fifteen died. This gives a mortality of forty per cent., which is about the average mortality from this disease in Havana,—a little more or less, but rather more.

"It will be seen that the result of our scrupulous investigation up to the present time has been, if not disadvantageous, at least without any advantage to the patient treated."

In a letter from Dr. Sollace Mitchell, from which I have already quoted, he says, "Dr. Gibier claims to have suggested the use of bichloride internally some weeks prior to yourself; he says that he suggested $\frac{1}{10}$ grain every hour; but as I experimented with doses from $\frac{1}{20}$ to $\frac{1}{60}$, and found that in six cases when $\frac{1}{20}$ was used severe cramps and diarrhœa followed in from six to eighteen hours, I doubt very much if a patient could bear $\frac{1}{10}$ grain with advantage to himself."

Dr. Mitchell has given me a list of forty cases treated by the bichloride alone; thirty-two of these were whites and eight colored; nine of the whites died,—a mortality of twenty-eight per cent; whereas the mortality among the same class of patients treated by the alkaline and bichloride method was only 6.3 per cent.

Dr. Mitchell has given the following summary statement of the results obtained by the two methods of treatment:

"One hundred and six cases, bichloride and alkaline treatment, with five deaths, and one recovery from black vomit. Forty cases, bichloride treatment, with nine deaths, and twenty-five recoveries from black vomit."

Now, as Dr. Mitchell has stated in his letter that the cases were not selected, but taken

"alternately" to test the various methods of treatment, it is evident either that in the first series of one hundred and six cases, with one recovery from black vomit, the absence of this symptom was due to the treatment employed; or that in the second series of forty cases, with twenty-five recoveries from black vomit, this symptom was, to some extent at least, a result of the mode of treatment. The latter supposition seems the most probable one, because the number of cases of black vomit reported is excessive, and if these cases had been treated by the expectant method, experience in other epidemics indicates that there would not have been so large a number of non-fatal cases characterized by this symptom. I infer, then, that the bichloride treatment, as tested in this series of cases, is liable to induce passive hemorrhage from the gastric mucous membrane. And, on the other hand, the first series of cases gives support to the belief that the tendency to such passive hemorrhage, which is a prominent feature in this disease, is diminished by the administration of full doses of bicarbonate of sodium from the outset of the attack.

I have but a single series of cases to report in which the bicarbonate of sodium was administered alone. These cases were treated at the "Quinta La Purissima Concepcion" by Dr. Duran. The formula used was: Bicarbonate of sodium, 6 grammes; sweetened water, 250 grammes. Of this mixture two tablespoonfuls were administered every two hours, or about 9 grammes (135 grs.) of the bicarbonate of sodium in the twenty-four hours. I have no information as to the character of the cases, or as to how long the treatment was continued. It often happens in the private hospitals of Havana that the patients, when brought to the hospital, have already been sick for several days, and the mortality is greatly influenced by this fact. In all, thirty cases are reported as having been treated by this solution, with eight deaths,—a mortality of 26.6 per cent. At the same time eleven cases were treated by the "antiseptic method," with six deaths,—a mortality of 54.5 per cent. The antiseptic administered was biniodide of mercury, 2 centigrammes, in 250 centigrammes of sweetened water,—two tablespoonfuls every two hours.

It will be noted that the amount of bicarbonate of sodium in the formula used at the Quinta La Purissima Concepcion was less than in my original prescription. I am disposed to think that it would have been better to increase the dose. This was done by Dr. Sollace Mitchell in the Sand Hills Hospital, at Jacksonville, and his results fully justify his judgment in this regard. In making my formula at first, in the absence of any clinical experience in this disease with the special remedies I proposed to use, I felt that it would be wise to keep within the bounds of perfect safety, but Dr. Mitchell has shown that the doses of bicarbonate of sodium may be considerably increased, not only with safety, but with excellent results. He says, "The formula that I finally adopted was:

℞ Sodii bicarb., grs. x to lx;
Hyd. chlor. corros., gr. $\frac{1}{10}$;
Aquæ puræ., ℥iv. M.

Give, *ice cold*, every hour during the day and every two hours at night."

This, taking the minimum amount,—10 grains,—would make three drachms of bicarbonate of sodium and $\frac{6}{10}$ of a grain of bichloride of mercury in the twenty-four hours. I prefer to prescribe a sufficient quantity for the twenty-four hours and to give the medicines more largely diluted. I noticed at Decatur that the patients not only took the mixture as originally prescribed by me without objection, but that they looked forward to the time when the medicine was to be administered, as they found the ice-cold drink refreshing. And as vomiting has not, in my observation, been induced, but, on the other hand, gastric irritability has been allayed, I can see no objection to giving the hourly dose in 1½ to 2 fluidounces of water. Indeed, I think that the taking of a considerable amount of fluid, if it is promptly absorbed by the stomach, is rather beneficial than otherwise. My original prescription contained an amount of water—1 litre—which in my judgment the patient might be permitted to drink, in divided doses, in the course of the twenty-four hours. Under certain circumstances, of course, this might be increased by giving small draughts of cold water, or bits of ice, in the intervals between the administration of the medicine. But excess in this direction will often induce vomiting, and I have desired to avail myself of the advantage of a formula which contains a proper amount of water, to be administered at short intervals, instead of leaving the administration of this fluid to the judgment of the nurse or the desires of the patient. In this way, also, the whole treatment becomes extremely simple and is easily carried out,—no small advantage for the busy practitioner during the prevalence of an epidemic.

In view of these considerations and of the experience of Dr. Sollace Mitchell with increased doses of the two ingredients contained in my original formula, I would suggest for further trial the following:

℞ Sodii bicarb., grammes xvi (℥iv);
Hyd. chlor. corros., centigrammes iii (gr. ½),
Aquæ puræ, litre 1 (1 quart). M.
Sig.—50 grammes (about 1¾ oz.) every hour; to be given *ice cold*.

Naturally the amount given should vary according to the age of the patient, and perhaps, also, with reference to the severity of the case. Thus a mild case might have two tablespoonfuls every hour during the day and every two hours at night; while a case which at the outset appeared to be of a grave character might take two fluidounces of the mixture every hour, day and night. Experience may show that the dose of bicarbonate of sodium may be still further increased, in severe cases, with benefit to the patient; but I doubt, in view of the evidence above recorded, whether there would be any advantage in increasing the dose of mercuric chloride. It would be a mistake to attempt to substitute a potassium salt for the bicarbonate of sodium in the above formula. The mercuric chloride, which remains in solution in presence of sodium bicarbonate, in the proportions prescribed, would be precipitated by carbonate of potassium. Moreover, the potassium salts are directly contraindicated in a disease in which there is a great tendency to suppression of urine and uræmic poisoning. The experiments of Zelz and Ritter, and of Bouchard, show that in uræmia the toxic symptoms are largely due to the retention of potassium salts rather than to urea. Bouchard, especially, as a result of his extended experiments, insists upon "the great importance of limiting potassium salts both in food and medicine" in the treatment of uræmia.

I may add that a rather extended trial of carbonate of potassium in full doses, made by one of the physicians of Decatur during the recent epidemic, was attended with a high rate of mortality, and that the physician referred to himself fell a victim to the disease, although his case at the outset appeared to be rather a mild one. How far the treatment influenced the result it is, of course, impossible to determine, but suppression of urine, and black vomit occurred on the fourth day, and death quickly followed.

HAVANA, April 6, 1889.

*REMARKS ON SPINAL INJURIES, MORE ESPECIALLY "RAILWAY SPINE," WITH HINTS ON EXPERT TESTIMONY.**

BY F. X. DERCUM, M.D., PHILADELPHIA, PA.†

GENTLEMEN:—Numerous interesting topics, especially the various medico legal relations of insanity, have been discussed *in extenso* by this Society, but, up to the present time, the extremely important subject of railway injuries has received little if any, attention. You are all, doubtless aware that annually many thousands of dollars are paid by railway companies, in the form of damages, for injuries claimed to have been received. The sums that have been paid out are in the aggregate very large, it being estimated by one writer that in the course of about a dozen years at least twenty million dollars have been paid out in this country and in England. Large as this amount seems, it should in nowise prejudice us in approaching the subject either as a whole or in testing the merits of any individual case. Let us bear in mind that whether this sum is to be looked upon as indicative, on the one hand, of the excessive number and frightful character of railroad accidents, or, on the other, of fraud on the part of plaintiffs, or of excessive sympathy on the part of juries, it can in no way enter into the discussion before us. At most, it merely illustrates the magnitude of the subject, or perhaps, impresses us with the very great importance of expert testimony. How important this testimony is, few will fail to realize. The result in many, if not in most, cases hinges entirely upon it. The accuracy of statement, the nicety of judgment, the personal integrity of the expert not infrequently turn the scale.

It is with some diffidence that I bring the subject before you. It is so extensive that I can only deal with its various parts briefly and in a general way. A volume would be required to do it justice. Further, the position I hold to-night is one of peculiar difficulty. In order to meet the needs of the occasion, I must speak as much as possible in language which our legal brethren, who are not supposed to have a knowledge of medical terms, can understand, while at the same time I must be technically accurate. Much al-

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† Instructor in Nervous Diseases, University of Pennsylvania; Neurologist to the Philadelphia Hospital

of what I shall say would be omitted in an address before a purely medical society, but which, if omitted here, would make my discourse unintelligible to one-half my hearers.

The injuries to which I invite your attention are injuries of the spine, more especially those which come under the head of "railway spine." The term railway spine is in many respects objectionable. It may convey the erroneous impression that there is some one clearly-defined affection of the spine to which it should be restricted; while in truth the injuries of the spine liable to occur in railway accidents are most various. Further, the expression implies that there is something peculiar in the injuries produced by railways, and that they differ from injuries from other causes, whereas the most varied accidents may produce identical conditions. Such, for instance, may be the case with a simple fall upon the back, the shock of an explosion, or a blow received from the timbers of a falling building. However, the term railway spine is in common use, and as long as we interpret it as signifying in a general way the various conditions resulting from blows, falls, wrenching, or jarring of the back, we run no risk of creating confusion by its use.

Injuries of the back are, of course, various in kind and degree. We may have in one case merely a bruise of the back, in another an actual fracture of the spinal column, and in another, still, marked nervous symptoms, without any visible signs of injury whatever. We find, then, at the very outset of our inquiry, a crude yet practical classification of spinal injuries presenting itself. In the first group we have those cases in which the various tissues of the back, the ligaments, nerves, and muscles, have been bruised or have otherwise suffered from strain,—*i.e.*, cases in which there has been no actual damage to the spine or its contents, but merely to the tissues immediately surrounding or in proximity to it. In the second group, in addition to fracture of the spine, we should include dislocation of the vertebræ at the time of the accident. It should be remembered that in these cases hemorrhage into the spinal marrow or its coverings and spinal concussion may occur as complications. The third group will include all those cases in which nervous symptoms are marked, but in which external proof of accident may be wanting,—*i.e.*, it includes, first, cases of injury to the spinal contents, such as concussion, hemorrhage, and late ensuing inflammation and degeneration; and, secondly, those cases in which no other symptoms are present than those of a persistent loss of nervous tone or that unstable state which we call hysteria.

You will say at once that groups two and three overlap; and, again, as regards groups one and two, that a blow sufficient to break the back must of course be sufficient to bruise the muscles and ligaments: in other words, that the various groups I have made merge into one another. Classifications are merely pegs on which to hang our ideas, and I believe that such a one as I have given you is more useful for our present purposes than a more elaborate classification based solely upon symptomatology.

Regarding group one, I shall have very little to say, as the diagnosis of the condition is relatively easy. The skin of the back is very dense and thick, and frequently powerful blows produce little discoloration, so that it not infrequently happens that in cases where the underlying muscles and ligaments have severely suffered, the skin itself exhibits no change. The muscles, on the other hand, occasionally exhibit decided swelling and distortion. The principle symptoms, however, on which we have to rely are excessive tenderness and pain on motion. Sprains of the ligaments are indicated by great rigidity of the spine, intense pain on motion, and often by involuntary spasm of the various spinal muscles, the spasm being likewise provoked by attempted motions. In some cases transmitted shock—*e.g.*, a slight vertical blow upon the head—causes acute suffering at the point of injury.

As you would naturally expect, these sprains of the back are more apt to be caused by accidents, which cause sudden flexion or sudden twisting of the body, and the history of the accident should, therefore, be taken into account in investigating a doubtful case.

As regards the outcome of these cases, it may be said that very many of them get well, but that rest in the recumbent posture for weeks, and often months, is necessary. Sprains of the muscles present, of course, a much more favorable outlook than sprains of the ligaments. The following cases, taken from my own experience, will illustrate this point: A medium-weight woman, aged 55 years, fell down a short flight of stairs, landing in such a way that the lumbar region struck the last step with great force. In addition to the temporary shock and nervousness of the accident, the patient complained of great pain in the region of the left quadrate lumbar mus-

cle. Inspection revealed it to be much swollen and exquisitely tender, and in its lower third a distinct groove or ditch could be made out by the fingers, as though some of the fibres had parted from their tendinous insertion into the innominate bone. The patient was kept in bed over four weeks, and even at that time tenderness and pain had not altogether disappeared. Another case is that of an old gentleman, 78 years of age, but in excellent health and of a very long-lived stock. He was thrown forward, while standing, by the unexpected starting of a train. He fell at full length, striking in his course his forehead against the door of the car in such a way that his head and neck were bent violently backward. When I saw him his head was held in an absolutely fixed position, while the tissues of the neck were everywhere exquisitely sensitive to deep pressure, and the slightest jar would give excruciating pain. The muscles of the back of the neck were hard and rigid, as though in constant spasm. In this case, the man being in comfortable circumstances, the question of a suit for damages was never raised, and he certainly was very anxious to get well. Several months afterwards, when last heard from, there had been no change in his condition. It is extremely probable that in this case the dense fibrous tissues comprising the ligaments of the spinal column, the intervertebral cartilages, and the numerous tendinous insertions of the muscles had been strained, so that the outlook, as far as speedy recovery was concerned, was not very favorable. It is worthy of remark that at no time were there any symptoms referable to injury of the spinal marrow.

I might multiply these cases almost indefinitely by citing from the records of various writers, especially the cases of Hilton.* However, my object to-night is to give expression to general principles rather than to detail.

In sprain of the back or spine, therefore, the symptoms to be sought for are rigidity, pain, tenderness, and frequently involuntary spasm of muscles on attempting passive movement. Tenderness should be sought for over the muscles and with deep pressure. The expert must be careful in doubtful cases not to confound this condition with hysterical hyperæsthesia affecting the skin, or with the so-called painful spine of hysterical and neurasthenic subjects; the tenderness in these instances is, of course, superficial.

* Hilton, "On Rest and Pain." Wood & Co., 1876.

In giving a prognosis in sprained back, the expert should be guided, in addition to general principles, by the fact that cases of mere muscle sprain progress more favorably than those in which the ligaments have suffered, and especially, do I think, should he be guarded in his opinion if pain is readily excited by transmitted shock; the latter symptom suggesting among other things injury of the intervertebral cartilages or the bodies of the vertebræ themselves. Further, nervous symptoms, such as I shall speak of later, should be carefully sought for, in order to exclude possible injury of the spinal contents. Again, the relation of blows and falls to the development of Pott's disease, is well known, and the expert should bear it in mind. An interesting illustration of this often late occoming affection is afforded by a patient now in the wards of the Philadelphia Hospital. He is a middle-aged man, who, while walking, was struck on the shoulders by a heavy bale of rags, the bale falling from the height of a third floor. The blow caused him to sink down suddenly on the pavement, while his thorax was forcibly flexed upon his abdomen. After recovering from a momentary shock, he walked to his home. Here he remained a little over two weeks, suffering the while with pain in the back. At the end of this time he resumed his occupation,—that of a carpenter—and the seriousness of his injury was not made evident until seven months after, when he began to lose power in his legs. At present he is decidedly paraplegic, and he suffers from marked displacement of the last dorsal and first lumbar vertebræ.

Another point to be remembered is, that severe contusions of the back are sometimes followed by bloody urine, due presumably to laceration of the tissue of the kidney. This symptom I have seen once in the case of a man who was squeezed between the bumpers of two cars. I have no time to enter further into the discussion of this symptom other than to say that a history of its presence invariably indicates that the accident was a severe one.

Let us now take up group second, which, I think, we can likewise dispose of briefly. It includes, as you will remember, fractures of the vertebræ and dislocations at the time of the accident. It is exceedingly improbable that gross fracture or displacement will require in courts of justice the services of an expert to establish their existence. The fact and degree of injury are with few exceptions readily recognized even by the layman.

the so-called "latent fracture of the spine," however,—*i.e.*, cases in which the fracture is attended by little or no displacement,—the symptoms may simulate those of sprain. Time, however, will almost invariably reveal the truth. Consecutive inflammation, necrosis, abscesses tell the tale. Further, the symptoms at the outset are usually, but not always, indicative of injury to the spinal contents,—*i.e.*, we have more or less marked paralysis of motion and sensation and of the bladder and bowels.

The third group, to which I will now pass, includes all those cases which present nervous symptoms, and in which visible evidence of injury may be entirely wanting. The first of its subdivisions deals with cases of actual injury to the spinal contents, such as concussion, hemorrhage into the spinal marrow or its coverings, inflammatory changes, and late on-coming degeneration. The second subdivision deals with those cases in which no other symptoms are present than those of a persistent loss of nervous tone, or, symptoms referable to hysteria, complicated, it may be, by a psychosis. This group is undoubtedly by far the most important. Indeed, many writers appear to restrict the expression "railway spine" to this class of cases. They are sometimes extremely difficult of solution, and they have on more than one occasion given rise to hard-fought legal battles.

To begin with, it is extremely probable that a trauma sufficient to injure the dura mater, especially its internal layer, will also be attended by actual damage of the spinal column, —*e.g.*, fracture, dislocation of the vertebræ, or later on-coming Pott's disease. Lidell,* however, regards meningitis "as among the possible consequences of sprains or wrenches of the vertebral column," and then cites an apocryphal newspaper case as an instance. Leyden† speaks of a case of traumatic pachymeningitis which was hemorrhagic, but the case is valueless, as it was complicated by a fractured skull, and the man had in addition presented symptoms of disease previous to his fall. Leyden, however, describes another case in which, following severe blows upon the back in a railway accident, there were late on-coming symptoms associated, as the autopsy showed, with extensive pathological changes. There was marked myelitis, together with a tumor of the dura and pachymeningitis. He also records that the vertebral bodies in the neighborhood of the disease were eroded.

While traumatic pachymeningitis must be excessively rare, the expert should not maintain that its occurrence is an impossibility. A conceivable method of its occurrence is the following: Hilton declares, as you may know, that the intervertebral cartilages are frequently damaged in injuries of the spine, —*i.e.*, that there is a partial separation of the cartilage from the body of the vertebra. Should this be the case, it is not impossible that inflammation should reach the dura by extension from the posterior vertebral ligament. However, apart from this occurrence being hypothetical, such an instance would come properly under the head of definite injury to the spinal column, and could not be classed as a simple uncomplicated traumatic meningitis. Still, it is not at all improbable that a perimeningitis, an affection which is external to the dura itself, can be set up by blows upon the back insufficient to produce actual disease of the bones.

Passing now to hemorrhage into the substance of the cord or into its membranes,—I mean, of course, gross and not capillary hemorrhage,—we enter a field where no doubt exists as to the possibility of the lesion. That it occurs, no one, not even Page, denies. When present, it produces such marked and grave symptoms that the fact of the patient being badly hurt is very evident. Hemorrhage into the substance of the cord is very frequently fatal, and in the few cases that live the permanent damage done is so unmistakable (wasting and paralysis) that the question for the expert to decide is not so much upon the fact of the injury as upon its extent, and even upon this latter point no great variance of opinion, I take it, would be likely to obtain.

As regards hemorrhage into the membranes, the gravity of the symptoms again places the average case beyond the range of question. It is only in those cases, again, in which a partial recovery takes place,—*i.e.*, in which the hemorrhage has been small in amount, or in which it has been low down in the spinal canal,—that a legitimate discussion can arise as to the permanent injury. Regarding the method of study and the duty of the expert, I will defer my remarks until we have reached a later stage of the subject.

We next come to the subject of true spinal

* Lidell, "Sprains, Twists, and Wrenches of the Back" ("International Encyclopædia of Surgery," vol. v. p. 688).

† Leyden, *Klinik der Rückenmarkskr.*, vol. ii. 406; *in f. Psychiatrie*, etc., 1878, vol. viii. p. 31.

concussion. I say *true* spinal concussion because in many cases of railway spine, which are sometimes loosely spoken of as cases of spinal concussion, no concussion has at any time existed. For the benefit of our legal friends, let me say that by concussion of the brain or cord, we mean that the part which has received a blow suffers a loss or perversion of function, which is of greater or lesser duration. The change is sometimes accompanied by slight structural change, such as the escape of blood from the capillary vessels,—*i.e.*, by minute hemorrhages. Very often, however, no visible change can be detected, and the alteration, whatever it may be, is molecular, and has been compared by one of our writers to the loss of its properties by a magnet when it is struck a blow.

Concussion of the spinal cord, unlike the other conditions I have mentioned, has, on the one hand, been freely and excessively admitted, notably by Erichsen;* and, on the other hand, has been as frantically and absolutely denied, notably by Page.† Let us see what one of our own clear-headed writers, a surgeon, has to say on the subject. Dr. William Hunt,‡ after referring to the well-known anatomical relations of the spinal marrow, and showing how well the latter is protected by fat, connective tissue, and its various membranes, proceeds to discuss the subject as follows: "Clinical observation is, I think, of far greater value in determining questions of the kind than any theory, however strongly supported by anatomical facts. Does transient concussion of the spine occur as transient concussion of the brain occurs? Page, if I understand him, says not. In his work on "Injuries of the Spine and Spinal Cord" (London, 1883), in criticising a well-known case as to the claim of persistent paraplegia without discoverable lesion, he says: 'We italicize the word persistent, for simple concussion of the brain may give rise to a transient unconsciousness, and, if the analogy holds good, concussion of the spine should *per se* produce a transient paraplegia. *We know of no case, nor can we discover the history of any case, where this has happened.*'

"I italicize the last sentence. In 1881 a boy came under my care who was shot in the back three inches to the right of the third or fourth dorsal vertebra. He at once had characteristic symptoms in the legs of being wounded in the spine in such a way as to affect the cord somehow. There was partial paraplegia, with pains in both limbs. Under rest these symptoms soon disappeared. In a few days I made a deep incision and removed some clothing and fragments of bone, and then from the depths of the spinal gutter I took a large conical ball which was resting against the bony bridge of a vertebra. The boy recovered rapidly. I saw him some months afterwards, perfectly well.

"Surely this was a case of spinal shock or concussion with transient paraplegia, and the cause of it could have been nothing else than the impact of the ball against the column, producing vibratory jar sufficient to affect the cord. The immediate symptoms and the rapid and complete recovery are, in my opinion, inconsistent with any theory of congestion or pronounced lesion of the medulla."

Another case recorded by Dr. Hunt was that of a man who, falling from a considerable height, landed on his feet. The force of the impact was sufficient to fracture both calcanea. In addition there was paralysis of the legs and loss of control over the bladder and bowels. The man recovered, the spinal symptoms improving along with the fractures.

As a third instance, the doctor cites the well-known case of President Garfield, in whom a bullet struck the spinal column, concussed the cord, and produced temporary loss of power in the legs.

These cases, then, constitute undoubted and undeniable concussion. However, from the further reading of Dr. Hunt's article, I infer that he limits the effect of concussion to *transient* loss or perversion of function, and that he is indisposed, to say the least, to admit any degree of permanence or chronicity or late appearance of symptoms.

The following case from my own experience certainly proves that symptoms accompanying shock may persist indefinitely: I was called one Sunday evening to a man 45 years old, who, while in a condition of average health, had fallen down a narrow and crooked stairway. Though not intoxicated, he admitted that he had been drinking. He fell backward in such a way that he landed upon the last step, striking it almost vertically with the shoulders and back of the neck. When I saw him he was much shocked and depressed and unable to move hand or foot, and his pupils were dilated. The next day I

* Erichsen, "On Concussion of the Spine." New York, 1882.

† Page, "Injuries of the Spine and Spinal Cord." London, 1883.

‡ Hunt, "Concussion of the Spine," Pepper's System, vol. v. p. 913.

him again, and he was still completely paralyzed in both arms and legs. There was decided impairment of sensation, though it was nowhere lost. Respiration appeared to be almost entirely diaphragmatic. There was retention of urine, and the bowels were obstinately constipated. There was at no time any vomiting. Under rest and various simple measures the man made an almost complete recovery. I say *almost*, because just here lies the point of special interest. At the end of six weeks he had so far recovered the use of his legs as to be able to leave his bed, and, to a certain extent, had regained power in his arms. The deltoids, however, were as yet almost completely paralyzed, and there was decided weakness of almost all the other arm muscles, especially of the extensors of the forearms. Sensation had become normal. He remained under my care for several weeks longer without any improvement in the condition of the arms, and about a year later, when I saw him again, decided wasting had taken place in the paretic muscles.*

Here certainly is a case in which spinal concussion was followed by persistent symptoms, symptoms, too, which are referable to organic changes in the cord. That organic changes of the cord result from blows and shocks to the back is maintained by authorities of no less weight than Spitzka, Gowers, and Edes. Spitzka, for instance, states that both in posterior sclerosis and in disseminated sclerosis the origin of the trouble can be traced in individual cases to shock and injury. Speaking particularly of disseminated sclerosis, Spitzka† says: "Railway spine is undoubtedly the mask of a disseminated inflammatory trouble in a number of cases." Edes‡ has called attention to the "somewhat frequent occurrence of degeneration of the postero-lateral columns of the spinal cord in so-called spinal concussion," and has placed on record four cases, one of which he verified by a post-mortem examination. Some of the most valuable testimony, however, is offered by Dr. Gowers,§ who not only places blows upon the back among the causal factors of both lateral and posterior sclerosis, but even maintains that damage to the cord by concussion of the spine, either local or general, is far more common than direct injury,—*i.e.*, injury resulting from fracture or dislocation, or from gunshot wounds or stabs. He divides the cases into three classes: First, "those in which the injury causes immediate and severe paralysis," and here there may be either no discoverable change in the cord or as marked a lesion as myelitis. In the second class he places "those in which there are at first either no symptoms or only trifling disturbance of function, but in which grave symptoms come on a few days or weeks after the injury," and, among others, records the following interesting case: "Thus a lady was severely shaken in a railway collision. She seemed, immediately after the accident, to have suffered no injury, but in a few days paraplegia developed, and from its consequence she died six weeks after the accident. Throughout the dorsal region of the cord I found indications of subacute myelitis, chiefly in the white columns, varying in its extent in different regions, but, in most parts, considerable in the pyramidal tracts."

When these patients survive, recovery is slow, but may ultimately be very great. In other instances it may be limited.

In his third class he places those cases "in which there are no early symptoms, or only slight and transient disturbance, but at the end of one or several months symptoms gradually come on, often such as indicate disease of some definite system of structure of the cord, degenerative in nature." This class, of course, includes the cases of lateral, posterior, and disseminated sclerosis already spoken of. Here is an example: J. D., aged 60, a marine engineer, had ten years ago a severe fall on the deck of a vessel. He fell from a height of ten or twelve feet, landing upon his right hip. The hip was severely injured, but not broken. He was confined to bed for several weeks, after which he was able to get about. His recovery, however, was never complete, and after a while he noticed that walking was becoming more difficult. Gradually he grew worse, and at present his gait is observed to be markedly spastic. The knee-jerks are exaggerated. There is no palsy of sensation. The sphincter of the bladder is paretic. No girdle sensations. No improvement during treatment.

* Since writing the above I have had the opportunity of again examining this man. Five years have now elapsed since his fall, and the palsy of the deltoid and upper-arm muscles persists unchanged. The wasting, however, does not seem as marked.

† Spitzka, "Disseminated Sclerosis," Pepper's System, vol. v. p. 884.

‡ Edes, *Boston Medical and Surgical Journal*, September 21, 1882.

§ Gowers, "Diseases of the Nervous System," Philadelphia 1888, pp. 434 *et seq.* Also, Duménil et Petil, "Commotion de la Moelle Épinière," *Archives de Neurologie*, 1885, vol. ix. pp. 1, 145, 307.

I will not further take up your time in adducing evidence to prove that the spinal cord may be seriously and permanently damaged by blows or shocks which fail to produce injury of the spinal column. It is indeed, in my mind, no longer a matter of opinion. Neither shall I take up your time by a discussion of the manifold symptoms which these patients present, as such a discussion would not only be necessarily of great length, but would also be excessively technical, and therefore out of place here.

I shall pass at once to the second subdivision of group third of our classification, which deals with cases in which the symptoms point to a persistent loss of nervous tone, or to hysteria, or possibly a form of insanity, and in which no evidence of a structural injury can be found. This class of cases includes some of the most difficult with which the expert has to deal. It is here that he must distinguish between the malingerer and the honest sufferer, for we must admit at the outset that traumatic neurasthenia and traumatic hysteria* are matters of actual occurrence. From one stand-point these cases should hardly be considered under the head of spinal injuries, as they are affections of the nervous system as a whole, and they appear to be a result not only of the mechanical shock, but also of the excessive mental and emotional excitement accompanying the accident. In fact, the term railway brain has been suggested as more suitable to some of these cases. Page† under the head of "Shock to the Nervous System," discusses this condition at some length and tabulates its various stages and symptoms. He defines it as shock of the cranial contents without any structural lesions of importance. At the same time, he admits that "some of the symptoms . . . often remain for years as the sequelæ of severe concussions." He also states that while‡ "the great majority of cases may happily be placed in the stage of convalescence, there are occasional instances of persons who never reach it, having succumbed at an early date to the severity of the shock;" and then he proceeds to cite two fatal cases, one dying on the thirty-seventh day and the other in about five weeks after the accident. In this connection he says, "Though moderate in character, it (the accident) no doubt exercised a very unusual influence in depressing vital powers,—never very strong naturally,—and finally inducing such an amount of nervous exhaustion as to terminate fatally, even though there were no evidences before or after death of physical injury to any one part." The second point, then, that we have to consider is, that the consequences of "shock to the nervous system," or traumatic hysteria, or neurasthenia,—whatever we may choose to call it,—may vary greatly in degree. From a mere temporary fright or nervousness, that passes away in a few hours or days, we may have all grades of functional disturbance up to those that gradually deepen into death. Luckily, however, the latter result is a very rare one. Many, perhaps the majority of cases, undergo more or less marked improvement with the progress of time, though this improvement is rarely, if ever, complete. Convalescence is always gradual, often very prolonged, and often extending over years.

Sometimes, as already hinted, the symptoms are strikingly hysterical. There is unusual mobility of the emotions, globus hystericus, perhaps hysterical palsy, and even hysterical hemianæsthesia. At other times we have more the symptoms of a general depression of nervous tone. The man is irritable, perhaps morose or hypochondriacal, incapable of even slight exertion. He complains of headache, inability to fix the attention, loss of memory, and inordinate susceptibility to the influence of alcoholic stimulants. "He may," as Knapp in his excellent paper puts it,§ "present no objective symptoms, but he remains an utter wreck. There is a general weakening, and a decline from the normal standard in the functions of the central nervous system, especially in the domain of thought, the will, and the emotions." In these cases, too, it should be remembered, a painful condition of the spine, probably neuralgic in character, persists, often for years.

I will not touch upon the various psychoses that occasionally follow trauma, other than to point out that the transition from such a condition of the nervous system as just described to that of actual insanity is merely one of degree. Krafft-Ebing‖ and others¶ admit its actual occurrence.

* Charcot, "Leçons sur les Maladies du Système Nerveux," vol. iii. Also, Putnam, *Boston Medical and Surgical Journal*, September, 1883, p. 217. Also, Walton, *Archives of Medicine*, August, 1883.

† *Loc. cit.*, pp. 170 and 171.

‡ *Loc. cit.*, pp. 167 *et seq.*

§ Knapp, *Boston Medical and Surgical Journal*, November, 1888. (Reprint.)

‖ Krafft-Ebing, "Lehrbuch der Psychiatrie," Stuttgart, 1888, p. 184.

¶ Hartmann, *Archiv für Psychiatrie und Nervenkrankheiten*, 1884, vol xv. p. 98.

In order to impress upon you more fully the condition of patients who are suffering from a nervous shock, I will cite the following cases from my own experience:

An estimable middle-aged lady, a fine, plump, and wholesome-looking matron, whom I had known for a number of years, had been, with the exception of occasional slight muscular rheumatism, in a condition of perfect health. While travelling in a railway train, about a year ago, she left her seat in order to alight at a station which the train was approaching. It so happened, through some mistake of the railroad employés, that a freight-engine was standing on the main track. A collision of course was the result, and the lady was thrown violently upon her back on the floor of the car. She was somewhat shocked and considerably bruised. Intense aching and soreness of the back followed, and from having been a self-possessed and common-sense sort of woman, she became nervous, depressed, and at times burst into causeless tears. She seemed to worry and yet to have no special cause for it. Her facial expression, too, changed from that of quiet and contentment to that of trouble and concern. In addition, she looked decidedly older. Improvement, however, gradually set in some eight months after the accident, and now, at the end of a year, she is almost well. Her nervousness has almost altogether disappeared, and her spirits are again up to the normal. All this has happened without the balm of damages. Her backache, however, though much lessened, still persists, but not steadily, being only troublesome now and then.

This case illustrates, therefore, a mild instance of nervous shock. Here is another in which the symptoms were more pronounced and of longer duration.

A perfectly healthy woman, 30 years old, had all of her life been accustomed to hard work, had borne a number of healthy children, and at times during the illness of her husband served truck with a horse and wagon, being out for many hours at a time, exposed to all sorts of weather, and climbing in and out of her wagon many times a day. One day, while four and a half months pregnant, she boarded a two-horse bobtail car. She took a seat near the back part of the car, sitting rather forward, so that her back was some distance from the back of the car-seat. The driver left his horses, still going at the same rate of speed, and entered the car to collect the fares. While thus engaged a collision occurred between the car and an odorless excavating truck. My patient felt a sudden jar, was thrown violently against the back of the seat, her back striking the back of the car-seat and her head the framework between two adjacent windows. She remembers nothing of what occurred immediately following, other than seeing some of the passengers reentering the car. She felt faint and sick, and took the next car home. Could not eat any supper, and could not sleep that night because of pain in the back. Got up the next morning, but suffered so much that she was obliged to go back to bed. Was in bed for three days. Had also at this time considerable flow per vaginam. On the third day commenced passing her water every few minutes. Was obliged to get up for this purpose frequently at night. This has continued ever since. Her condition remained unchanged for a month, when on attempting some unusual exertion she became unconscious. On coming to, she discovered that she had lost power in the left arm and leg. These members were completely paralyzed. She improved, however, and at the end of a week was again able to walk, though she did so with difficulty. Three months later, when I first saw her, the left leg was still weak. I made at the time the following note: On stripping the patient and examining the spine two very tender spots are detected, one over the seventh cervical vertebra and the other over the sixth or seventh dorsal. Lesser but decidedly painful areas are discovered in the lumbar and sacral regions. Grip of the left hand decidedly diminished. Left leg drags perceptibly in walking. Stands well on the right foot, but is in danger of falling when attempting to stand on the left. Knee-jerk excessive on the right side and diminished on the left. Complains that the left leg and arm feel dead and numb, especially the leg. When examined by the æsthesiometer, the responses are decidedly slow. On the right side they are immediate. On the left side she separates the points either not at all or with difficulty. On the hand the points must be two and a half to three inches apart before she recognizes a dual impression. On the arm she cannot separate them at all. On the leg there is a patch of absolute anæsthesia on the outer aspect of the calf. On other portions of the limb sensibility is merely diminished. On the right side the responses are everywhere normal. At the time of this examination she was eight and a half months pregnant.

The patient continued in this state, without any change of her symptoms beyond some increase in the weakness of the left side, until

she fell in labor. The latter, which was very unusual in her case, was very prolonged, lasting three days. It was terminated, however, without the use of instruments. On the second day following she commenced to have headache and a diffused pain in the entire left side. This headache persisted for some six weeks. Two weeks after her accouchement she left her bed. Walked, however, with great difficulty, and on one day the loss of power on the left side was again all but complete.

Four weeks afterwards she was examined again. There was continual aching all down the spine, but the tender spots before noticed had disappeared. She was still compelled to pass her water very frequently, though she thought that she was a little better in this respect. The left hand, too, had gained somewhat in strength. The right leg now was weak, more so, indeed, than the left. The knee-jerk was much diminished on both sides. Cutaneous sensibility of left side was improved, though still below normal.

For one month following she continued to improve, the improvement, especially in walking, being very marked. Then she reached a stand-still, the backache, headache, weakness, and numbness being now better and now worse. Her general nutrition and color excepted, no decided change in her condition could be noted several months later. At the present time, a year and a quarter after the accident, her symptoms persist, though in a lessened degree, especially the headache, backache, and weakness in the knees.

I should state that in this case, though it involved a suit for damages, the period of the improvement bore no relation to the time of the trial, the maximum improvement taking place some six months previous to the latter.

In this case, then, the nervous shock, influenced no doubt also by the fact that it occurred in a pregnant woman, resulted in a pronounced hysteria, and that, too, in a woman who had previously had a robust and fibrous temperament.

It will lend additional interest to this case when I tell you that the child born of this woman has epilepsy. The seizures commenced shortly after birth, and continue now at irregular intervals. They appear to be in every way typical, and average three or four a week. No member of her family has ever suffered from this disease. Surely this looks like a case of maternal impression, and suggests to us how profound the shock must have been to the nervous system of the mother.

Another case is that of a man, and is particularly interesting as being the outcome of a series of accidents. The following is his history: M. C. B., aged 47, married, and at present is an oil distributor in the employ of the Pennsylvania Railroad. Was born in Missouri. Claims to have come from healthy stock. Was perfectly well up to eighteen years of age. At that time contracted gonorrhœa and a venereal sore. Did not suffer from any sequelæ that he can remember. Married later, and has had a family of apparently healthy children. Wife has had no miscarriages. One child died shortly after birth, said to have been a "blue baby."

His own health had always been good, and for this statement I have not only his own assurance, but also that of his wife. In 1877 he was injured as follows:

He was working as a brakeman on the Pennsylvania Railroad, and while coupling cars his body was caught between the "nigger-heads" of the tank of the engine and of the cabin. He was badly squeezed from before backward, so severely, indeed, that it seemed to him as though the edges of his lower ribs touched his backbone. He was in this position fully five minutes. He was not senseless when he was extricated, but would certainly have fallen to the ground had he not been caught by his mates. He was taken to the University Hospital, where he remained upward of five weeks. At the end of the fourth week he could stand, and before the end of the fifth he was able to walk around the hospital. Thinks now that he could have walked earlier had he tried. He was, however, exceedingly nervous, and on returning to his position he found that the sight of a passing train made him giddy. His feet and legs were also exceedingly cold. He also had backache, headache, and slept badly. He continued without marked change in his condition until 1880, when he met with another accident. This time he was struck in the back by the bumper and iron step of a cabin, the latter moving, he asserts, at a rapid rate. He was knocked senseless and received a scalp wound, but, strange to say, returned to his work two days afterwards. His backache, headache, nervousness, and giddiness all increased in severity. He also noticed that he could not see as well as before. In 1881 he had still another accident, and this seems to have been the last straw that broke the camel's back. While coupling cars three fingers of the left hand were caught and mashed. Two of them required partial amputation. His nerv

vousness, sleeplessness, and pain in the back were now worse than ever. The backache was at times so bad as to absolutely interfere with his work. He was now an oil distributor. Some six months after this accident, being on night duty, he returned home in the morning and, after a slight altercation with his son, went to bed. After sleeping about an hour he awoke screaming with all his might. He screamed for several minutes, was perfectly conscious, but was utterly unable to control himself. After this his general condition remained about the same until 1887, when he had another screaming spell. These spells recurred and soon became very frequent. Sometimes he had as many as two spells a day, and they occurred indifferently during his waking or sleeping hours. He was always conscious during the attack. The spells have been less frequent of late. Before the attack comes on he feels as though something were being pumped up his back, and "by the time it reaches his throat it bursts" and he *must* scream; there is no help for it. After the spell is over he feels as though something were running down through his trunk, the sensation being very much like that which is conveyed to "the hand in grasping a garden-hose through which water is running."

In addition to these undoubtedly hysterical symptoms, the man has still a painful back, and which is very tender on pressure. Headache is also a frequent symptom. Clavus hystericus is sometimes present. He says that at times his calves are anæsthetic, but this, if true, is a variable symptom. He is also constantly complaining of new and strange pains and aches.

There is no contraction of the field of vision, but Dr. de Schweinitz reports that the optic nerves are gray. There is also a very slight inequality of the pupils, but this appears to be normal. Response to light and accommodation are also normal.

This case, then, appears to be one, all things considered, of very pronounced hysteria and neurasthenia, and undoubtedly the various traumas received were the essential causes.

Before closing, let me impress upon you again that the classification of spinal injuries I have proposed is purely arbitrary, and, while most cases permit of being classified under some special head, others may be found in which the symptoms are referable to two or more divisions of our classification. It is possible, for instance, that a sprain of the [illegible] be accompanied by damage of the spinal contents or *vice versa*, or that either of these conditions be accompanied by hysteria. The mere presence of sprain of the back should not, therefore, lead the expert to ignore the possibility of injury to the cord, nor, on the other hand, should the presence of undoubted hysterical symptoms lead the expert to ignore the possibility of actual structural change. However, it is the duty of the expert, whenever possible, to separate the organic affections from the purely neurasthenic or hysterical. The distinction is a vital one, inasmuch as it affects the future of the case and of course the result of the suit for damages. As regards the prognosis of hysteria, its degree and the concomitance or non-concomitance of neurasthenia are to be considered. Simple uncomplicated hysteria, it must be remembered, offers, other things equal, far better chances of recovery than simple neurasthenia, especially when the latter is profound. As a matter of fact, however, hysteria and neurasthenia so often go hand-in-hand that a sharply-drawn distinction cannot always be made. Again, neurasthenia is to be considered, other things equal, as the more serious the more pronounced the mental symptoms, remembering that actual insanity, though rarely, may supervene.

Lastly, regarding malingerers,—that is, those whose affection is neither hysterical, neurasthenic, nor organic,—the expert must rely largely upon his mother-wit for the detection of the fraud. Distinction between actual and simulated organic disease can, as a rule, be readily made, though between simulated disease and hysteria the line is sometimes hard to draw. Hysterical functional disease is, however, *real as far as the patient is concerned*, and needs *no active effort* on the part of the patient to maintain its outward manifestations, while in the malingerer a *constant effort* is required, and if closely watched he may be caught napping. Further, there is a marked difference, as a rule, in the mental attitude. The hysterical patient is generally emotional in the extreme, and presents such typical symptoms as globus hystericus, clavus, or even typical hysterical hemianæsthesia. The malingerer is, on the other hand, a complacent, often argumentative, liar, and occasionally displays a superficial familiarity with technical terms, as though he had studied his part. Not infrequently he contradicts himself, and can, by leading questions, be trapped into the grossest absurdities. Neurasthenia, as already stated, is so frequently wrapped up with hysteria that here another

point of difference can be sought for. The malingerer, of course, bears upon his face, other things equal, the aspect of health; shows no change in his pulse or heart's action; there is nowhere any evidence of vaso-motor relaxation, no cold and bluish extremities, no change in the reflexes, etc.

This brief summary would be incomplete if I did not point out the danger to which the expert is exposed by the exaggerations, voluntary or involuntary, of people who are really hurt or who honestly believe that they have been hurt. The investigation must be both detailed and exhaustive, and the patient should be encouraged to talk, and talk freely, while the doctor should be a quiet listener, carefully weighing and recording each statement. After all, it will be his common sense and native acumen which will guide him in his conclusions.

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*SPINAL LOCALIZATION IN ITS PRACTICAL RELATIONS.**

By Charles K. Mills, M.D.†

PART I.—GENERAL CONSIDERATIONS.

SPINAL localization, particularly in its practical relations to surgical procedure, is one of the topics of the hour which has not yet been fully discussed in any of our Philadelphia medical societies. Although its proportions do not approach those of cerebral localization, the subject has sufficient literature and interest to allow of lengthy treatment and open a wide field of discussion; but it will be necessary for me to be brief in order to cover the ground.

Spinal trephining is by no means a recent operation; it has an ancient history both as regards suggestion and actual performance. Horsley‡ speaks of it as known to surgery since the time of Heister (1757), but Lidell attributes the suggestion to Paulus Ægineta. An operation of M. Louis, performed in 1762, is sometimes referred to as the first instance of spinal resection, but, as stated by Ashhurst and Lidell,§ it was not a resection at all, but merely an extracting of some loose fragments of bone on the fifth day in a case of gunshot fracture involving a dorsal vertebra, an operation which was performed twenty-four times during our civil war with satisfactory results. Genuine spinal trephining was first performed by Henry Cline, June 16, 1814, for fracture of the twelfth dorsal vertebra. Horsley, writing last year, cites Erichsen as stating that it has been performed in all about thirty times; but Ashhurst, about the same time or earlier, tabulated fifty cases. Of these fifty cases, thirty-three died, seven were not benefited, four were relieved, two recovered, and in four the result was unknown. I have collected fifteen cases in addition to those in Dr. Ashhurst's table, and doubtless a few others have escaped me. In addition to these I have personal knowledge of three other cases in which spinal trephining has been performed, but in which the accounts of the operations have not yet been published.

While we have here, however, a record of sixty-eight cases in which the operation of spinal trephining has been performed, a close study of the details of these cases shows that very few operations were guided strictly by the rules and principles of spinal localization. External pointers, as deformity, depression, or swelling, were commonly present. Gowers and Horsley's case of spinal tumor is perhaps the most brilliant example of localization, and vies with the cases of Macewen and Abbe in brilliancy of result.

Many experimental investigations of the functions of the spinal cord have been performed by Brown-Séquard and a host of physiologists, but the first experiments to determine the exact functions of the horns of the cord at various levels were those of Ferrier and Yeo,‖ in 1880. Pathological observations had been made prior to this time and have been since, and are largely confirmatory of the results obtained by these investigators. In 1884, Starr¶ collected most of the work on this subject up to that date. Ross** has worked in the field of sensory localization to good purpose, contributing an excellent paper on the "Segmental Distribution of Sensory Disorders." Much material of a highly practical character will be found embodied in Gowers's "Manual of Diseases of the Nervous System" and in Seguin's contributions to localization in the "American System of Practical Medicine." Recent valuable papers, partly neurological and partly surgical, on spinal

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† Professor of Diseases of the Mind and Nervous System in the Philadelphia Polyclinic, etc.

‡ *Med.-Chir. Trans.*, vol. lxxi., Lond., 1888, p. 383.

§ "Intern. Encycl. Surg.," vol. iv.

‖ "Proc. Royal Soc.," No. 212, and *Brain*, July, 1881, vol. iv. p. 223.

¶ *Am. Journ. Neur. and Psych.*, vols. ii. and iii. p. 443.

** *Brain*, January, 1888.

localization are those of Thorburn.* This writer records nineteen cases of injury to the cervical region of the spinal cord, studied with the view of determining the exact spinal localization as indicated by such injuries. He has also contributed a valuable article on injuries of the cauda equina. Osler† has published a brief paper on lesions of the conus medullaris and cauda equina, and on the situation of the ano-vesical centre in man. Other papers on allied topics have been contributed by Bernhardt, Oppenheim, and Kirchoff, who are cited by Osler.

It is important to closely study every case of supposed spinal focal lesion, whether from injury or disease. Reports of such cases, particularly when accompanied by autopsies, will continue to be useful until a number of points now obscure become clear; but even without autopsies they may be of great value if minute and accurate. Some of the papers on cerebral localization, most valuable because of their suggestiveness, have been purely clinical and largely speculative; as, for example, some of Hughlings Jackson's and Broadbent's on affections of speech. One of the most instructive articles on spinal localization, that of Remak‡ on the localization of the lesion in anterior poliomyelitis is based entirely on clinical cases. From a careful study of many cases, Remak shows how various groups of muscles are frequently affected together, and, reasoning back to the lesion, concludes that disease in a certain segment or adjoining segments of the spinal cord will produce paralysis in a group of muscles which act together. He made some highly-interesting observations with reference to palsies of particular muscles or muscular groups. These investigations will be referred to again later in this paper.

NOTES OF CASES OF SPINAL FOCAL LESION, WITH AUTOPSIES.

Let me first refer briefly to a few cases of spinal focal lesion, with autopsies, occurring in my own experience, briefly commenting on them with reference to the possibility of successful operation.

While it has been my fortune to see a large number of patients suffering from intraspinal focal lesions, I have made comparatively few autopsies on such cases. I find among my notes, however, records of six post-mortem examinations, three of which have been reported. Of the six cases, two and perhaps three might have been trephined with some show of success. One of these was an injury in the lower dorsal region in which the lamina of the twelfth dorsal vertebra had been broken and driven inwards, a case similar to one of the operative cases reported by Macewen, similar even to the vertebra injured. A bony mass was present about half an inch long by one-quarter of an inch wide in the external layer of the dura, just at the lower end of the spinal cord. This mass, which was like the bony concretions sometimes found in the falx cerebri, could have been removed by operation, after elevation of the depressed and broken spinal arch.

In another case operation might have been of benefit if performed immediately after the accident. The most important features of this and the first case were as follows: A history of severe injury to the middle and lower spine; this was followed at once by pains in the back and limbs, spinal rigidity, anæsthesia, and paralysis of the lower limbs and of the bladder and bowels. The condition remaining was one of motor paralysis, wasting, contraction, depressed electro-contractility, coldness and lividity, peculiar zones of anæsthesia, and abolition of the tendon reflexes in anæsthetic regions. In this second case, at the upper edge of the twelfth dorsal vertebra adhesions were found which continued down the canal for three or more inches. At the commencement of the cauda equina, which was about the centre of the adhesion, caries of the first lumbar vertebra was found, the portion involved being the inner surface of the laminæ close to the junction of the body. Above and below the caries the adhesions were most persistent. The conus medullaris, cauda equina, and membranes were a glued mass. For an inch or two more above and below this the membrane was considerably thickened, a deposit being present of a calcareous nature.

In a case of caries and dural tumor, of which I exhibit specimens, the patient might perhaps have been benefited by relief of pressure. This patient, a man 72 years old, was admitted to the Philadelphia Hospital with a history that he had been lame in his left leg, the result of a fall, since he was ten years old. No relatives or friends could be found, and, as his mind seemed somewhat clouded, it was difficult to obtain from him any statement of value as to his past condition. It was learned, however, that three

* *Brain*, January, 1887; January, 1888; and October, 1888.

† *Med. News*, vol. liii., December 15, 1888.

‡ *Arch. f. Psych.*, ix.

or four months before admission he had had an attack in which he suffered from diarrhœa and fever; that he became weak in both legs, but largely recovered power in them, until four weeks before admission, when he became a complete paraplegic.

He had no paralysis of the face and arms. His left leg was shorter than his right, and was considerably atrophied, measurements showing about an inch difference between the limbs. Motor paralysis was complete in both legs, but he had control over the bowels and bladder. Tactile sensation was diminished in both legs, and on his trunk to a line on a level with the third dorsal spine behind and the fourth rib in front. Pain and temperature sense were preserved. He complained of a belt-like feeling around the waist at the highest level of the anæsthesia. He had a sacro-ischiatic bedsore nearly central in position. He died a few days after admission to the hospital. The brain showed no gross lesion. On opening the spinal canal, when the line of the fourth dorsal vertebra was reached the dura mater was found to be strongly adherent, requiring dissection, and a small tumor or enlargement was attached outside of this membrane on the lateral aspect of the cord. It was about three-quarters of an inch in length and one-third of an inch in thickness. Possibly the cord was slightly diminished in general bulk from compression at this point, but it was not abnormal in consistency, and no hemorrhage nor inflammation were present. The body of the fourth dorsal vertebra throughout was found to be eroded and in a carious condition. For a little distance below the periosteum was detached and the bone partly exposed. The disease of the bone had destroyed nearly the whole of the interior of the body of the vertebra. Below the index-finger could be passed into the cavity, while above was a shell or bridge of bone. The vertebra was not displaced. The intervertebral cartilage between the fourth and fifth dorsal vertebræ was also necrosed. The upper lobe of the right lung was strongly adherent to the bodies of the third, fourth, and fifth dorsal vertebræ. A communication existed between the space in the decayed vertebra and the pleural sac.

In two cases of syphilomata of the dura mater of the cervical region, operation would have been useless from the nature, extent, and high level of the lesions.

The sixth case was one of hemorrhage into the cauda equina, the symptoms being similar to those in the second case referred to above. The question whether in such a case early trephining at the lowest point of the lumbar region would have been feasible, and would have offered any prospect of relief, will be considered later.

SPINAL OPERATIONS GUIDED BY LOCALIZATION. SPINAL FRACTURES AND DISLOCATIONS.

Trephining the spine in whole or in part, guided by the rules of localization, may be resorted to for fracture, dislocation, tumor (including certain hypertrophic inflammatory pachymeningeal lesions), hemorrhage, abscess, caries, and neuralgia.

Page* has said, with reference to fracture and dislocation, that trephining of the spinal column can be of no advantage; but this is certainly far from being true of the former, and even in some cases of dislocation the operation may be of assistance to the surgeon in bringing about reduction. Other eminent surgeons, as Lidell and Ashhurst, hold that more lives are lost than saved by interference. Whether operation in cases of fracture and dislocation will or will not succeed is largely a question of exact diagnosis of the extent and location of the injuries. When, for instance, it can be demonstrated by close study that the brunt of the injury has been borne by the spines and laminæ, operation should be at once performed, and even when in doubt it is better to explore rather than to hesitate in the face of paralysis or death.

An interesting recent successful case is one performed in 1887 by an English surgeon, Mr. Jones, reported by Thorburn in *Brain* for January, 1888, and also later, as to result, in the *British Medical Journal* for October 20, 1888.

The patient, a collier, aged 15, was injured by a heavy stone striking him on the shoulders and back. He received a fracture of his right femur, and was also instantly rendered paraplegic. The limbs presented a position of partial paralysis, with wasting, lost faradic contractility, absent knee-jerk, changed skin reflexes, paralysis of the bladder, cystitis, and priapism. Sensation was blunted or lost over special nerve areas in the lower limbs. The third lumbar spine presented a prominence. To the left and above was another bony prominence. Trephining was performed. The detached spine

* Heath's "Directory of Surgery," p. 134, quoted by Horsley.

of the second lumbar vertebra was removed, and showed a gap between the arches of the second and third, filled with dense cicatricial tissue. By means of bone forceps the arch of the second lumbar was now almost entirely removed, exposing the membranes of the cord, which had obviously been compressed by it. Around these membranes was also cicatricial tissue, which was not interfered with. Twenty months after the operation the patient was exhibited at the Manchester Medical Society by Mr. Jones. The condition of the patient was then very satisfactory. Sensation was normal in both legs, which were, however, much wasted, and there was evidence of degeneration in the muscles of the left limb. The movements of the knee-joint were normal, but those of the ankle were limited to extension, flexion being practically abolished. He had perfect control over his bladder, and could urinate normally. He was able to walk three miles with short intervals for rest. When standing he was obliged to lean on some support unless he bent his knees. He was gradually improving.

An equally interesting, but unsuccessful, case, operated upon by Mr. Hardie, is also reported by Thorburn.* The patient was a man 38 years old. The operation was performed October 26, 1887. The patient had a fall of six feet from a wagon, and immediate paralysis without loss of consciousness followed. He had pain across the shoulders and shooting down the arms to the elbows, and arching backward of the cervical vertebræ. The lower limbs, abdomen, and thorax were absolutely paralyzed. His respiration was diaphragmatic, with sense of dyspnœa and cough. All the muscles of the right upper extremity were paralyzed, and the extrinsic muscles of the right upper limb also paralyzed,—the pectorals, spinati, latissimus. The neck muscles were normal on both sides. The muscles of the left upper extremity escaping paralysis were the biceps, supinatus longus, deltoid, supra-spinatus, and infra-spinatus. Both palpebral fissures and pupils were smaller than usual. Anæsthesia extended as high as the third rib in front and the sixth cervical spine behind; on the right side there was sensation over the region of the deltoid and slightly beyond it, and on the left over the deltoid and down the outer side of the limb to the thumb. No hyperæsthesia was present. Knee-jerk, plantar, cremasteric, gluteal, and epigastric reflexes were absent. The temperature was normal. The urine was retained, the penis turgid. His pulse was 66, with a marked respiratory wave. A vertical incision about four inches long was made over the cervical spines, with its centre opposite the fifth. The muscles being cleared from the laminæ, an interval of about a quarter of an inch was found between the fifth and sixth spines, and the fifth vertebræ appeared to be slightly displaced forward. The laminæ of the fifth and sixth vertebræ were removed by bone forceps and the dura mater exposed, presenting a perfectly normal appearance without any trace of hemorrhage. The patient died the next day. The heart-beats, which were very feeble and infrequent, continued for about ten minutes after respiration had ceased, but stopped at 3.35. The disk between the fifth and sixth cervical vertebræ was found to be ruptured, the former bone projecting very slightly forward. No fracture was discovered. The dura mater was uninjured, but the cord was flattened opposite the seat of the injury, and was much contused for about an inch above and below, containing hemorrhage in its substance and in the central canal; elsewhere its structure was normal.

In lesions of the cauda equina which cause compression, whether fracture, hemorrhage, or abscess, but particularly fracture, trephining is undoubtedly indicated in most cases, and in some, with our present light, it is imperatively demanded. This view I take from personal experience of cases with autopsies, and of others which I have studied clinically. The same view is strongly taken by Thorburn,† who shows that some of the objections which are valid against trephining higher in the vertebral column, do not apply so fully to injuries of the cauda equina. He advocates trephining in injuries of the cauda equina, always bearing in mind the following conditions:

"1. We must be sure of the localization.

"2. We should, if possible, wait for a reasonable period, say six weeks, before operating, and should then do so only if the patient shows no signs of spontaneous recovery.

"3. Should the paralysis of the bladder be early followed by severe cystitis, and should we suspect secondary renal troubles, what are we to do? On the one hand, not to operate probably means death; and on the other, the risk of operation is enormously increased. Further

* *Brain*, October, 1888.

† *Brain*, January, 1888, p. 406.

experience may enable us to settle this problem, but at present the outlook appears to be sufficiently gloomy. A third course has suggested itself to me, but I have had no opportunity to test its results,—viz., to drain the bladder by means of a suprapubic cystotomy. The object of draining the bladder is obvious, and the suprapubic appears preferable to the perineal route, because we are thereby enabled to construct our fistula through parts which are not anæsthetic and predisposed to slough. If we could thus prolong life for a time, we might afterwards proceed to operate upon the spinal column with fair hopes of a successful result, and encouraged by the great improvement effected in the case of R. M. C., and the cure obtained in a case recently published by Lauenstein, in which there was complete paralysis of the lower limbs, etc., from a dislocation of the twelfth dorsal vertebra, and where a perfect cure resulted from the removal of the misplaced arches. It would appear, therefore, that whether 'trephining the spine' is or is not justifiable in cases of injury of the cord, it is certainly the proper treatment to pursue in those of the cauda equina, and hence the importance in such cases of making an exact diagnosis."

SPINAL TUMORS.

In most cases of tumor of the spinal cord or its envelopes, operation would not for several reasons be completely successful. It would, however, be entirely successful in some, and I have come to the conclusion that almost all cases should be trephined for the chance of success, or to relieve pain and diminish the effects of pressure. When the growths spring from the bone or dura mater the chances are, of course, the best.

Even if the neoplasm is situated in front, or surrounds a large part of the cord, trephining might be successful, for during operation the lateral and even the anterior aspects of the cord can be explored, the latter certainly by cutting one or two spinal nerves. This can be seen by examining the cord in position in a fresh specimen. With a little care, using a blunt hook, the cord can be rolled and lifted so as to examine it on almost every side in position. Erosion or caries, with perforation of the body of the vertebræ, can also be determined by careful explorations with properly-curved probes thrust around and beneath the exposed cord.

Three operations for spinal tumor, all of them successful, have been reported by Macewen,* Gowers and Horsley,† and Abbe.‡ The case of Macewen was a boy, 9 years of age. The operation was performed May 9, 1883. The main symptoms were complete sensory and motor paraplegia, with incontinence of urine and fæces. Angular curvature was present, most marked between the fifth and seventh dorsal vertebræ. The laminæ of the fifth, sixth, and seventh dorsal vertebræ were removed. A fibrous neoplasm attached to the theca, between it and the bone, was dissected off. After this, cord pulsations, which had been absent, returned. Twenty-four hours after the removal of the pressure the limbs had lost their livid color and were distinctly warmer; the spastic rigidity had greatly lessened. The sense of tickling had returned to the soles, and that of touch had improved. After eight days the first return of movement was observed; soon after he had perfect control over his sphincters. Six months subsequently he was able to go about without support, and five years afterwards he walked three miles to pay the doctor a visit. He attended school regularly, joined in all the games, including foot-ball, and said he felt quite strong. Charcot has pointed out the occurrence of these connective tissues in cases of caries, and one of the specimens exhibited in connection with this paper is a tumor of this character.

The case of Gowers and Horsley was a man, aged 42 years, and the operation was performed June 9, 1887. He had suffered for three years from localized pain beneath the left scapula. The pain varied considerably. He showed great mental irritability and hypochondria. Four months before operation first the left and then the right leg became weak, and gradually there was complete paraplegia. He had motor and sensory paralysis up to the level of the sixth or seventh dorsal nerves, with intense spasm in the legs, with foot clonus and rectus clonus. Urine was retained and he had some cystitis. He suffered with severe pain around the trunk, which was greater on the left side, and increased to agony by any movement. Caries and syphilitic disease of the spine were excluded. The spines and laminæ of the fifth, fourth, and third dorsal vertebræ were removed, and a fibro-myxoma, about the size of a filbert, was discovered and removed. Mr. Horsley reported, January 4, 1888, that

* *Lancet*, August 11, 1888.

† *Brit. Med. Journ.*, January 28 and June 16, 1888, and *Med.-Chir. Trans.*, vol. lxxi.

‡ *N. Y. Med. Rec.*, February 9, 1889.

the pain was for a time slightly relieved, but again and again returned with great severity, and the power of motion was only slowly and intermittently regained during the first three or four weeks. The local pain gradually diminished and motor power gradually returned. The surgical result was excellent. He reported, June 12, 1888, that the patient had lost the agonizing pain, and at the same time gradually recovered motor and sensory power, as well as the control of the bladder and rectum. He remains in perfect health.

One of the most recent contributions to the subject of spinal trephining, that of Dr. Robert Abbe,* is a case of extradural tumor of the spine, with complete paraplegia, in which the operation resulted in recovery. The patient was a young man, aged 22 years, and the operation was performed on May 26, 1888. The first symptom was pain in the back; swelling of the soft parts two inches wide by three long. There was disturbance of tactile sensibility in both legs, followed by gradually-increasing paresis. The line of hyperæsthesia was between the anæsthesia and the normal skin. He had uncontrollable twitching of the legs, which were cyanotic when dependent. The spine became rigid and very painful; the hyperæsthesia, anæsthesia, and paralysis deepened. He suffered with girdle pains about the limiting line of the disease. He had incontinence of urine and fæces. Active hectic was present. The spines and laminæ of the eighth, ninth, and tenth vertebræ were cut away, and a dense mass of tissue and desiccated pus was removed by scraping. Sensation began to return on the eighth day; in the fourth week he began to move his left leg and toes on the right. The fever and pain disappeared, and in six weeks he moved both legs. He improved continuously, and in four and a half months he moved, pushing a chair. He was exhibited to the Surgical Society of New York eight months after the operation, when he walked well without support and was stout and heavy.

In the disease described by Charcot and Jeffroy as hypertrophic internal pachymeningitis, operation for the removal of the lesion might in some cases prove successful. Usually after the disease has existed some time the lesion becomes practically a fusiform tumor of considerable size. It might be objected, perhaps, that the disease is inflammatory in character; but, on the other hand, it is chronic, often of slow development, and sometimes almost stationary. No harm could result in a disease always one of great suffering and eventually fatal, and great relief and possibly a cure might sometimes be effected.

* *N. Y. Med. Journ.*, November 24, 1888, and *N. Y. Med. Rec.*, February 9, 1889.

INTRASPINAL HEMORRHAGE.

As within the cranium, so within the spinal canal, hemorrhage may be of four varieties as to location,—namely, (1) supradural or extrameningeal; (2) subdural; (3) subarachnoid or subspinal; and (4) intraspinal,—that is, into the spinal cord itself. The hemorrhage may be posterior, anterior or lateral, or antero-lateral, postero-lateral, etc.; but commonly it will surround the cord; if intraspinal, it may be into the anterior or posterior horns, the central gray matter, or columns, but usually it will be diffused through the cord. With reference to the question of trephining it is only practical to consider supradural or subdural hemorrhage.

A net-work of large blood-vessels lies between the dura mater and spinal bone, and from this supradural spinal hemorrhage usually occurs. Such an extravasation may be minute, of moderate size, or very extensive. The symptoms of supradural hemorrhage will vary, of course, with its location and extent. The history is generally of a sudden attack, often after a fall or exhibition of violence of some kind.

Hemorrhage between the dura mater and the bone probably usually finds its way down the whole length of the spinal canal to the beginning of the sacral canal. The space surrounding the cauda equina in the lumbar canal is comparatively large, and the much-narrowed sacral canal is placed at a slightly different level, so that much of the effused blood would probably accumulate in the lumbar region. The fat and connective tissue between the theca and the bone are loosely distributed in the extradural space, and differ considerably in amount in different individuals, so that in some cases more than others much of the blood would be entangled and coagulated in the meshes of the connective tissue and fat near the seat of extravasation. The subdural space, although much smaller than that outside of the dura, is a smooth serous cavity, and therefore much of a hemorrhage at any level would also probably descend into the region of the conus and cauda equina.

I do not know of any reported case in

which trephining has been resorted to simply for the relief of intraspinal hemorrhage. In a case of resection at the Bellevue Hospital, New York, by Dr. Stephen Smith,* it is reported that notwithstanding from eight to twelve ounces of extravasated blood, having a dark color, escaped from the spinal canal after the depressed bone had been extracted, the compression of the cord from extravasated blood and the paraplegia steadily crept upward, and finally caused death by asphyxia. The case is reported to show that the operation of trephining the spinal column or resecting the vertebræ would not relieve the spinal cord from compression when it was exerted by the extravasation of blood.

The diagnostic symptoms of meningeal hemorrhage as given by Gowers and others, and according to my own experience, are as follows: (1) sudden and violent pain in the back, less or more diffused; (2) pain along the course of the nerves passing through the membrane near the extravasation; (3) abnormal sensations,—tingling, etc., and hyperæsthesia, referred to the same parts; (4) spasm involving vertebral and other muscles supplied by affected nerves and also sometimes the muscles supplied by the cord below the seat of the hemorrhage; (5) sometimes general convulsive movements; (6) sometimes spasmodic retention of the urine; (7) consecutive paralytic symptoms, but not usually complete paralysis.

Some points of differential diagnosis between meningeal hemorrhage and extravasation into the substance of the cord should be borne in mind. Symptoms of irritation, such as pain, hyperæsthesia, paræsthesia, and spasm, in meningeal hemorrhage are usually immediate or very early, and may precede paralysis, which is commonly not complete. In hemorrhage into the substance of the cord paralysis may be very complete at first, or rapidly become so, and symptoms of irritation may be very largely wanting. Hemorrhage may, and not infrequently does, involve not only the membranes but also the substances of the cord, giving complex symptoms.

In some cases of intraspinal hemorrhage, whether primary or secondary, trephining might be performed in two places in order to make sure of a good result,—namely, at the supposed seat of the extravasation, and at the lowest portion of the lumbar spine, where, as already indicated, much of the extravasated blood would gravitate. Kronlein, it will be remembered, has recommended that in cases of cranial meningeal hemorrhage, two trephinings should be performed if one is not successful, and several cases of failure in trephining for intracranial hemorrhage have been reported, which would have been successful had the second operation been performed. In like manner, two trephinings of the spine, or a single trephining at the lowest possible place in the lumbar region, might prove successful where failure would otherwise result.

The somewhat frequent occurrence of spinal hemorrhage, with fracture of either the body, spines, or laminæ of the vertebræ must not be overlooked. The diagnosis of the exact height of the lesion and the decision as to trephining may often have to be settled negatively or positively through a consideration of the question of the probability of a double lesion in cases of accident,—namely, both fracture and hemorrhage. The fracture and the hemorrhage may be situated at different levels, or if the hemorrhage occur primarily at the seat of the fracture it may find its way down the canal.

I might give many illustrations gathered from medical and surgical literature of intraspinal hemorrhage in which operation would probably have proved successful, but I will confine myself to two, one twenty years old and the other a recent case.

Jackson† reported an interesting case of localized spinal apoplexy, which with our present lights might perhaps have been relieved and a life saved by careful trephining. The patient was a bright girl, 14 years old. While dressing her fingers felt weak. The next day she had a similar weak feeling in her hand. One day later she was unable to move her arms except at the wrists. Later, the intercostal muscles did not act quite freely, and she seemed to lie heavier in the bed. Moist crepitant râles, with a little cough, developed. On the fifth day after the first symptom careful examination clearly demonstrated great loss of power in all the voluntary muscles of respiration and in those muscles of the arm, back, and chest supplied by the cervical nerves. The diaphragm became fixed, and there was slight lividity about the cheeks, with a fall in the natural temperature. Sir W. Jenner, who was called in consultation, diagnosticated a clot in the cervical portion of the spinal cord. Death soon

* Lidell, in the "Intern. Encycl. Surg.," vol. iv. p. 379.

† *Lancet*, July 3, 1869.

took place without pain. The whole cervical portion of the spine, but particularly in front and to the left, was embedded in an oblong clot of dark venous blood outside the membranes. The clot ceased at the seventh cervical vertebra.

In this case, as the reporter remarked, the effusion probably took place very gradually, had room to extend itself, and coagulated very slowly and imperfectly. Until the phrenic nerves were interfered with nearly every symptom might have been attributed to hysteria.

The following case was reported by Dr. Arlidge to the Staffordshire branch of the British Medical Association.* The patient, 34 years old, a drinking man, was admitted to the infirmary with complete motor paralysis of the legs, and some weakness in the arms, where, too, formication and numbness were experienced. Sensation was normal, and the legs were painless and their reflexes abolished. His only complaint was of dorsal pain. The bladder was distended, and prior to admission had been emptied by the catheter, but there was no dribbling of urine. Some rhonchi were noted in the upper part of the left lung; heart healthy; bowels confined for four days; the cerebrum undisturbed. The first temperature taken was 103.6°, but the next day it fluctuated between 105° and 106°, and rose to 107.4° the day preceding his death, on September 26, and was accompanied by some delirium. A post-mortem examination revealed a copious hemorrhage within the meninges of the spinal cord, extending downward from the last cervical vertebra for about six inches. The blood was coagulated. No ruptured vessels were found in the cord itself, and no cerebral disease, although the dura mater was very adherent to the skull. There was no fracture of the spine, and no caries of any vertebra.

CARIES AND ANGULAR CURVATURE.

The question of operation for the relief of angular curvature of the spine is one of considerable importance and not to be dismissed hastily. Such an operation has been, until lately, commonly regarded as useless or worse. Its dangers have been overrated, although they are doubtless greater somewhat than most cranial operations. Macewen has reported an extraordinary series of six cases, in which elevation of the posterior laminæ of the vertebræ was performed,—in four with recovery. In favor of operation are,—(1) the fact that by thus allowing the cord to expand backward a present serious paralysis may sometimes be relieved without imperilling the ordinary chances of recovery by anchylosis; (2) when an approximate cure has been effected by anchylosis, but a paralysis or contractures remain, the latter may sometimes be relieved and improved; (3) secondary degeneration of the cord may sometimes be prevented or arrested; (4) when the paraplegia is produced by the connective tissue or other tumors which sometimes accompany angular curvature, rather than by the latter, such growths can be removed. Against operation are,—(1) that cases can sometimes be cured without such heroic procedure; (2) that caries often involve the body of so many vertebræ that operation is often useless or worse.

Trephining in such cases has been performed twice at the Philadelphia Hospital by Dr. White in cases of Dr. Dercum.

A case is reported by Mr. G. A. Wright,† of a boy, 7 years old, who was operated upon January 26, 1888. Disease of the spine was observed one month before operation, with marked angular curvature in the mid-dorsal region, with some lateral thickening. Paresis of the lower limbs was present, and the patient grew gradually worse. Before the operation he had complete paralysis of both lower extremities, with incontinence of urine and fæces. Anæsthesia to the level of the eleventh rib on the right side, and on the left decrease and finally loss of sensation, developed, the anæsthesia extending from the toes to the level of the pubes; from thence to the line of the eleventh rib a condition of analgesia existed. The muscles of the lower limb were in a state of tonic contraction, with marked flexion. The plantar reflexes were exaggerated; cremasteric very feeble, and deep reflexes could not be obtained. His feet were slightly swollen and cyanotic. Until late the symptoms were more marked on the right side than on the left. External and internal treatment were used without avail. Three laminæ were removed in the dorsal region. The theca of the spinal cord exposed was surrounded by a buff-colored, tough, leathery substance, which was cut away with the scissors. The cord did not appear to pulsate, but no point of constriction could be found. Some

* *Med. and Surg. Rep.*, March 23, 1889, vol. lx. No. 12, p. 370.

† *Lancet*, July 14, 1888.

improvement took place in voluntary motion and sensation during a month following the operation. Later, the area of anæsthesia increased, and the condition of the patient became about the same as it was before operation.

SPINAL ABSCESS.

Spinal abscess, like brain abscess, is usually a complication found in connection with disease of the bodies of the vertebræ, and localization rules will not commonly be of much value in making a diagnosis. Pus at any level within the spinal canal will, like blood, usually find its way to the lumbar region. In rare cases suppuration is confined to the space between the dura mater and bone, and when our diagnostic acumen becomes greater we will doubtless in some of these cases be able to trephine with advantage to our patient. Pachymeningitis, with or without suppuration, is generally due to traumatism or vertebral caries, but occasionally cases appear to arise as primary or idiopathic.

In this so-called idiopathic suppuration in the spinal dura mater, trephining low down to give exit to the pus might in rare cases prove a useful procedure. Such a case is that reported by Dr. Robert Maguire.* Other cases have been reported by Mueller, Spencer,† and others.

In Spencer's case of idiopathic inflammation of the spinal dura mater, the patient's illness began with pain in the feet and knees and in the small of the back, frequently shooting down the back to the legs. He had fever and diarrhœa. There was great tenderness on pressure over both lumbar regions. The surface of the body was covered with copious acid sweats. Temperature elevated; pulse rapid, wiry, regular; tongue dry, white fur in the centre, red at the tip and edges. Breathing became rapid and somewhat painful, with a dry, hacking cough. The patient became delirious and his pain in the back very severe, but no paralysis until late. The neck was very stiff. There was a peculiar purplish mottling on the chest and abdomen. He became steadily weaker and died. The whole spinal canal was filled, from within two or three inches of the head down to the sacrum, with thick, creamy pus of a light yellow color and containing numerous shreds of lymph. The pus was found to lie outside the dura mater, between it and the periosteum. The pus had found its way out of the canal through the intervertebral foramina, and surrounded the spinal nerves for some distance. It had also passed out through the laminæ and infiltrated the connective tissue between the muscular structures on each side of the spine, forming collections of various sizes, the largest opposite the lumbar vertebræ. These were not abscesses, but infiltrations of pus into the interstices between the muscles. The tissues around these collections of pus were softened and the spinal nerves were laid bare. The most noteworthy of these collections was one opposite, and to the right of, the sixth and seventh dorsal vertebræ; the pus had here found its way under the costal pleura and projected into the thorax as a tumor, the size of a large hen's egg, lying close to the spine. In this case trephining low down as well as operations in the external abscesses might have been performed.

NEURALGIA.

In rare cases of intractable neuralgia trephining and section of the nerves close to the spinal cord may be tried as a last resort. This operation has been performed in one case by Dr. Abbe,‡ of New York, on the recommendation of Dr. C. L. Dana. The patient, a man 44 years old, was operated on December 31, 1888, and January 2, 1889. His symptoms began with throbbing pain on the posterior surface of the right forearm above the middle; later, paroxysmal pain, giving a peculiar twitching sensation in the thumb, index, and middle finger; after some months there was complete disablement of the hand, which he kept in a stiff position with the fingers semiflexed. The forearm and hand were slightly emaciated, with atrophy of the muscles in the interosseous spaces. The posterior, interosseous, and ulnar nerves were stretched without any improvement. The arm was amputated about the humeral insertion of the deltoid, but without abatement of pain. The morphine habit had been contracted. He had twitchings and tonic contractions of the muscles of the trunk; also the Brauch-Romberg symptoms; he swayed in standing and had a tendency to fall to the right. Knee-jerks were exaggerated, and there was ankle clonus in the right leg. The right shoulder showed muscular atrophy, and stiffness in the neck muscles. A small tender neuroma of the muscular nerve was removed

* *Lancet*, July 7, 1888.
† Ibid., June 14, 1879.
‡ *N. Y. Med. Rec.*, February 9, 1889.

without relief. The right half of the laminæ of the third cervical to the first dorsal spine was removed. Both motor and sensory roots of the sixth and seventh cervical nerves were cut square across outside of the dura. The posterior roots of the seventh and eighth cervical nerves were cut off close to the posterior columns. The patient made great improvement.

In the second part of this paper I will treat of the rules and principles for localizing spinal lesions for operative or other purposes.

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*REMARKS ON THE UNPLEASANT EFFECTS OF SULPHONAL.**

By J. P. Crozer Griffith, M.D.†

IT is the almost invariable history of every newly-introduced drug of real therapeutic value that, at first received with almost unanimous approbation and enthusiasm, the disadvantages which it possesses have gradually come to the fore; so that many physicians whose experience with it has chanced to be unfortunate have gone to the other extreme, and have discarded a remedy really capable of rendering great service. One has but to recall the history of cocaine to become convinced of the truth of this statement. Antypyrin, too, was and, indeed, still is used with a freedom and carelessness which the experience of many has shown to be dangerous; and the once "harmless" acetanilid now produces collapse and death. Yet these and many other of our materia medica, though capable of doing harm, are much oftener productive of the greatest good if properly used, and if their possible dangers are kept in view. In like manner sulphonal came to us highly recommended by its earlier users, and with scarcely a dissenting voice concerning its admirable hypnotic action and its entire freedom from unpleasant effects. Having reported a year ago, in conjunction with Dr. Elwood R. Kirby, the result of some clinical experiments with urethan and amylene hydrate as hypnotic agents, I began with great interest and great expectations the administration of sulphonal as a drug of the same class. Experience in a large number of cases has convinced me, however, that though a very valuable agent, it is by no means without the power of producing undesired and quite unpleasant secondary effects; and cases now not infrequently reported in the journals confirm this opinion.

It is not at all the object of these remarks to decry a useful medicine, but to aid in establishing its true value in comparison with other hypnotics; and, by pointing out some of its possible disadvantages, to warn against the unpleasant surprises and disappointments which might otherwise lead to its abandonment. The cases to be detailed by way of illustration have occurred entirely in my own experience. Those quoted from medical literature do not at all complete the list of unfavorable cases reported in the journals.

1. First to be noticed among the disadvantages of sulphonal, and undoubtedly a very prominent one, is its *slowness of action in producing sleep*. This is to be carefully borne in mind in determining the hour of its administration; and the patient should perhaps be notified of its peculiarity, or disappointment and dissatisfaction may arise. This slowness of action has so usually been noticed in the cases under my care, that to cite instances of it would be only tedious. So generally, indeed, has the experience of clinicians agreed as to this point, that Kast, who first employed the drug, has written a second article (*Therap. Monatsh.*, July, 1888), which might almost be called a *defence* of sulphonal, and in which he discusses the reasons of this long delay in action. As a result of experiments on animals and with digestive solutions outside of the body, he advises that it be administered in a finely-pulverized condition, in at least 200 c.c. of a warm fluid, with the evening meal between seven and eight o'clock. The presence of a large quantity of fluid, of hydrochloric acid, peptones, and of salts favors the rapid absorption of the medicine.

2. Another and even greater difficulty to be overcome in the use of sulphonal is the *marked tendency which its hypnotic action has to persist during the succeeding day*. The following case is an excellent example of this:

Case I.—Mr. Robert S. Ulcerative endocarditis with aortic insufficiency and very troublesome insomnia. 20 grains of sulphonal given at about 10 P.M. He did not fall asleep for some hours, but throughout the whole of the next day until late in the afternoon he was so overcome by sleep and so stupid that replies could scarcely be obtained to questions addressed him, and the family became quite alarmed. The same condition was seen on another occasion after a dose of the same

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*Read before the College of Physicians, Philadelphia, May 1, 1889.

†Instructor in Clinical Medicine in the University a; Physician to St. Agnes Hospital.

size. In fact, sulphonal seemed always in this case to produce sleep lasting only a few hours at night, while upon the next day the patient could scarcely rouse himself. In such a case as this it is not pleasant on entering the room to be greeted by the friends with the words, "Oh, doctor! Those powders, those powders!"

The following less striking case illustrates the same continuance of action after a still smaller dose:

CASE II.—William S. Phthisis and chronic rheumatism. Insomnia usual, though not as a result of cough or pain. After 15 grains of sulphonal, given at 8.30 P.M., the patient slept well, but continued drowsy until noon of the following day.

The same condition is exemplified by some of the other cases to be presently related. (See Cases III., V., VI., XV., and especially XII.)

This prolonged hypnotic action has frequently been referred to by writers. L. L. Johnson (*Med. News*, September 8, 1888), for example, reports a case in which the patient promptly fell asleep after 30 grains of sulphonal given in the evening, but was very somnolent until afternoon of the next day. In smaller amount the drug acted very well. Algeri (*La Riforma Medica*, No. 233, 1888) says that the action of large doses continues through the following day, and Oestreicher (*Berlin. klin. Wochenschr.*, June 18, 1888) has seen sleep remain absent during the night, but persist through the following morning. Lovegrove (*Brit. Med. Jour.*, May 26, 1888), too, states that the effects on patients to whom he gave the drug were very discouraging. For several hours after taking it no appreciable action could be noticed, but during a great part of the next day there was extreme drowsiness and considerable cyanosis. The case of Schotten's, presently to be quoted, is of especial interest in this connection. Kast discusses this "postponed action" in the article referred to, admitting that it is often witnessed, and that it constitutes a great disadvantage when it is necessary that the patient be actively employed during the day. For this difficulty he has no special remedy to propose in addition to the method of administration described, except that the dose be carefully adapted to the individual.

3. But this *determination of the individual dose*, in order to overcome the difficulties mentioned, itself constitutes a sometimes insurmountable obstacle to the use of sulphonal. I have frequently found that the amount necessary to produce satisfactory sleep was followed by the prolonged effect on the following day, or by various unpleasant after-effects presently to be described, while any smaller amount failed to bring the desired result during the night. In quite a number of cases it was observed that a small dose merely served to render the patient uncomfortable in the night and upon the following day, while a full dose procured satisfying sleep, and the morning was free of prolonged action or disagreeable after-effects. It would seem sometimes as though sound sleep were necessary to exhaust, so to speak, the action of the medicine. Matthes (*Centralbl. f. klin. Med.*, No. 40, 1888; *Wien. med. Blätter*, December 13, 1888), too, reports a case in which very marked disagreeable after-effects appeared to develop because the sulphonal-sleep had been much disturbed by outside causes.

The following cases are examples of the fact that a large dose is sometimes less objectionable than a small one, and are also illustrative of the difficulty in determining the proper amount to give:

CASE III.—George H., aged 15. Rheumatoid arthritis. Troubled with nervous insomnia. 15 grains of sulphonal were almost entirely without hypnotic action, and 25 grains had but little more effect. After these smaller amounts there were short, bewildered, troubled periods of sleep throughout the night, with a tendency to talk at random; and upon the days following the patient was drowsy and uncomfortable. 30 grains, however, produced six hours' continuous, restful sleep, entirely without unpleasant after-effects.

CASE IV.—Miss O. Hysteria; great nervousness and insomnia. Sulphonal in a dose of 30 grains, given on three successive evenings, was only productive of short, delirious dozes, and upon the morning following there were nausea, headache, and generally unpleasant sensations; so that the patient begged that no more of the drug be given her. A further trial was made, nevertheless, and 40 grains were administered. This gave her six hours' sound, uninterrupted sleep, with no unpleasant sensations on the next day. The 40 grain doses were continued during some weeks with great satisfaction to the patient. She later found that 20 grains were often sufficient, but if very nervous she was obliged to take the larger amount.

The dose probably most often recommended by writers is 1 to 3 grammes, and it has been repeatedly claimed that unpleasant effects only follow the administ

of a dose unnecessarily large. The cases which I have described show that this is not the fact. I should say, too, that I have repeatedly, and indeed usually, commenced with a small dose, but have generally found it insufficient; and can recall but one instance in which 10 grains exerted a hypnotic action. Rosin (*Berl. klin. Wochenschr.*, June 18, 1888), who has carefully tested the size of the necessary dose, found that 1 gramme was seldom, if ever, enough to cause sleep, except in those cases in which starch, given under the name of sulphonal, had an equally good effect; and Funajoli and Raimondi (*Archiv. italiano per le mal nervos.*, etc., 1888, xxv. 325) believe that the efficient dose for men is 4 grammes and for women 2 grammes, and that the best results are not obtained until the third night of administration. Too much attention cannot be given to the proper method of testing hypnotics, as so well described by Rosenbach (*Berlin. klin. Wochenschr.*, June 11, 1888), and to the absolute necessity of eliminating the influence of psychic impressions before concluding that sleep is due to the medicine given. The relief of pain and the production of sleep by morphine powders composed of sugar of milk is a ruse too well known to need remark. Matthes (*loc. cit.*) comments on the difficulty in determining the dose of sulphonal, since it not only seems to vary greatly with different persons, but at different times with the same individual. He gave 5 grammes to one patient without any effect whatever, while in another case which he reports the drug had been used repeatedly with good results; but on one occasion a dose of only .5 gramme occasioned very unpleasant symptoms.

A somewhat similar instance is the following:

Case IV.—Lizzie H. Insomnia. 40 grains of sulphonal were taken on retiring on four consecutive nights. On the first three a rather restless slumber, in which the patient talked somewhat, began in one to one and a half hours; followed at about 3 to 4 A.M. by a deep sleep lasting until 8 or 9 in the morning, when she woke refreshed. On the fourth night, instead of passing into the deep, quiet sleep at 3 o'clock, she rose, still unconscious, walked about the room with a candle in her hand,—a rather dangerous proceeding,—and screamed at the top of her voice. As she had never been known to act in this way before, her relatives were not without reason in considering the medicine at fault, and in urging her to take no more of it.

4. *Unpleasant secondary effects* have been already alluded to in these notes as constituting one of the disadvantages of sulphonal, and some of them have been mentioned in the cases already described. Many writers have observed them, so that the claim made by the makers of the drug and by some of its users, that it is totally without disagreeable secondary action, is not substantiated. Zerner (*Wien. med. Wochenschr.*, November 10, 1888), indeed, estimates that these effects are seen in 10 per cent. to 12 per cent. of all cases, and Matthes (*loc. cit.*) says that they were noted in a majority of his patients. Prominent among them may be mentioned a *condition of excitement* developing instead of the wished-for sleep. The following case illustrates this condition:

Case VI.—Mrs. McC. Disseminated sclerosis; extreme and persistent insomnia, for which various hypnotics had been used in vain. Small amounts of sulphonal had no effect whatever. Finally 60 grains were given on each of four consecutive nights, but the patient appeared only to become more excited and nervous, and more wakeful, if possible. On the days following the nights of administration she was drowsy and uncomfortable.

Other illustrative cases are the following:

Case VII.—Jennie S. Neurasthenia; anæmia. Annoying insomnia was relieved nicely by paraldehyde, but 30 grains of sulphonal were absolutely without action. 40 grains given early on two successive nights made her very excited and semi-delirious, without producing any desire for sleep until about 4 A.M. From this time until the evenings of the days following she experienced nausea, headache, and vertigo, and was so generally uncomfortable that she flatly refused to take any more of the drug.

Case VIII.—Mrs. E. Rheumatoid arthritis; simple insomnia. 35 grains of sulphonal had a very exciting effect throughout the whole night, producing short, dreamy snatches of sleep. On the next day there was nausea and drowsiness.

Case IX.—Mrs. B. Simple insomnia. 20 grains of sulphonal only excited the patient through the whole night, and produced no sleep whatever.

Case X.—Tak Sing. Obstruction of the superior vena cava; persistent insomnia. 15 grains of the drug were given at 10.30 P.M., and repeated in an hour. The patient slept about half an hour after each dose, but for the remainder of the night was unusually restless.

CASE XI.—James B. Alcoholic delirium of a mild type. The patient was restless, never violent, often wanting to get out of bed, but easily restrained. He was sleeping quietly at 4 A.M., when 40 grains of sulphonal were given as a test, and in about half an hour he became very unruly and delirious. He had not acted so badly before, nor afterwards until the like amount was administered on two other occasions, when the same results were observed. On another day 20 grains, given at 7.30 P.M., produced so much restlessness and wakefulness that 45 minims of amylene hydrate had to be administered at midnight, after which he went to sleep.

It is worthy of note in this case that paraldehyde, chloral, or the bromides also exerted a quieting influence; while hyoscine produced on two occasions effects similar to those of sulphonal.

One more illustration may be given.

CASE XII.—Mr. H. Mitral regurgitation. Troubled greatly with insomnia. 40 grains of sulphonal administered on each of several nights produced for some hours intense drowsiness and the desire to go to sleep, without the power to do so. The patient walked the floor, and felt "trembling" and nervous, and queried afterwards whether the powders could have made him so "light-headed." After about two hours of this condition he fell asleep, and was very drowsy during all of the day following the administration of the drug. His wife, too, remarked that "the medicine had an effect on his brain."

A tendency to an excited mental condition *accompanying* but not *replacing* sleep is shown by Cases III. and IV., but especially by X.

Temporary *delusions* after the ingestion of the drug are reported by Fürbringer (quoted by Zerner, *loc. cit.*), and may be classified in the same category with the excited mental conditions I have reported.

Nausea, *dizziness*, and *headache* have been already mentioned in Cases IV., VI., and VII. as effects which may follow the ingestion of sulphonal. A similar instance is as follows:

CASE XIII.—Sallie C. Mitral stenosis. 30 grains of sulphonal had no effect for several hours. On the following day the patient felt uncomfortable, and suffered from headache and dizziness. 40 grains given on another occasion produced five to six hours' sleep, but the after-effects were the same.

Matthes (*loc. cit.*) says that in some of his cases *ringing in the ears*, headache, and dizziness were experienced on the next day; and that in two instances *vomiting* occurred. Among the patients of G. W. Rachel (*N. Y. med. Presse*, November, 1888) was one in which 1.5 grammes of sulphonal were followed by fourteen hours' sleep, and later by a sense of dizziness. Otto-Dalldorf (*Deut. med. Wochenschr.*, August 23, 1888) and Rosin (*loc. cit.*) have likewise witnessed dizziness, which sometimes lasted nearly the whole of the next day. Rabbas (*Berlin. klin. Wochenschr.*, April 23, 1888) has seen vomiting on the morning after the ingestion of sulphonal, and in another patient *diarrhœa* occurred; but he is not certain that these symptoms were attributable to the action of the medicament. *Heaviness in the head* and dizziness were observed by Sachs (*N. Y. Med. Rec.*, October 6, 1888) in a patient who had taken two doses each of 2 grammes three hours apart. Schwalbe (*Deut. med. Wochenschr.*, June 21, 1888) has in several instances observed dizziness, headache, nausea, and in one case vomiting, after a dose of only 1 to 1.5 grammes, and S. G. Burnett (*N. Y. Med. Journ.*, March 2, 1889) has seen two instances of vomiting.

The production of a marked *sense of fatigue*, of *depression*, and of *confusion of mind* is not infrequently referred to by authors. J. Fränkel (*Berlin. klin. Wochenschr.*, July 23, 1888) has found these symptoms so decided in a number of patients that the drug could no longer be given them; Matthes (*loc. cit.*) refers to the sense of exhaustion and depression as the secondary effects most frequently observed, and Oestreicher (*loc. cit.*) has seen them in one or two out of eighteen cases. In one of these it was very pronounced, and the patient refused to take the medicine again. Ott (*Prag. med. Wochenschr.*, October 3, 1888) refers to the sense of fatigue on waking as the chief bad symptom which the drug leaves behind it. He reports a case in which 3 grammes caused vomiting and an attack of *fainting*. The confusion of mind is exemplified in several of the cases I have reported, especially in Case XII.

In two instances I have seen full doses of sulphonal produce a *disturbance of gait*.

CASE XIV.—James M. Aortic regurgitation; insomnia. 40 grains of sulphonal were followed by sleep lasting most of the night; but on the next day the patient suffered from swimming in the head, and oscillated while walking.

CASE XV.—Mr. C. Plethora. Greatl troubled by insomnia. After 40 grains c

the drug, given in the evening, the patient slept well, but could with difficulty rouse himself on the following morning, and felt all day as though stumbling over something.

The occurrence of a drunken, staggering gait has also been reported by Zerner (*loc. cit.*) and by Otto-Dalldorf (*loc. cit.*). Bornemann (*Deut. med. Zeitung*, November 26, 1888) reports a case of the morphia habit in which 60 grains of sulphonal were taken at about 9 P.M., and one-half of this amount at 1 A.M. As a result there developed very marked muscular inco-ordination with great mental depression, lasting to some extent during six days. This is a case in proof of the observation already made by Ziehen (*Arch. f. Psychiat. u. Nervenk.*, B. xx. H. 2), that severe motor inco-ordination and a somnolent condition are liable to appear if sulphonal be given at the same time with opium or to opium habitués. Still another case in point is that recently published by Fischer (*Neurolog. Centralbl.*, 1889, No. 7), in which the drug, given repeatedly to a morphia habitué, produced on two occasions not only ataxia of the limbs, but indistinctness of speech. Burnett (*loc. cit.*) mentions the occurrence of muscular inco-ordination after the ingestion of sulphonal. He further reports *intense thirst* and great *dryness of the mouth* produced by it in three cases.

Engelmann (*Münch. med. Wochenschr.*, October 16, 1888) details a case in which 3 grammes produced an erythematous *eruption* over the breasts and inner surface of the arms, attended by considerable itching. Another instance of an eruption occurred in a case of Schotten's (*Therap. Monatsh.*, December, 1888), in which 2 grammes of sulphonal, given on each of two succeeding nights, produced but little sleep at night, but depression on the following days. After 3 grammes on the third evening the patient slept all night, but seemed completely exhausted and extremely drowsy on the next morning, and suffered from persistent headache and loss of appetite. This condition lasted four days, when improvement set in, and simultaneously an eruption exactly resembling measles appeared over the whole body. Kisch (*Berlin. klin. Wochenschr.*, No. 7, 1889) reports three interesting cases of ill effects from sulphonal. In the first, a patient with hemiplegia from a recent apoplexy slept the entire night after taking 1 gramme of the drug. On the next morning, however, he had complete *aphasia*, and only after eight to ten hours did this disappear, the patient meanwhile feeling very weak. The second patient, after taking 3 grammes of sulphonal in divided doses during the night, felt wretched and exceedingly languid on the following morning, and complained of great depression and of a feeling as though his senses were leaving him. The *pulse was also retarded*, beating only 38 in the minute, and this symptom did not disappear for several hours, and under the use of stimulants. The third patient, a man 62 years old, slept soundly after 1 gramme of the drug. On the following morning he was horrified to find that he had had a *nocturnal seminal emission*,—the first for over ten years. He also felt as though stupefied during the whole day, and could not leave his bed.

Schmey (*Therap. Monatsh.*, July, 1888) details most unpleasant results following the administration of sulphonal to a case of angina pectoris from arterio-sclerosis. Nitrite of amyl had reduced the attacks to one to two a day, and amylene hydrate produced sleep very satisfactorily. As the patient complained of the taste of the latter, the author administered 2 grammes of sulphonal, soon after which *attacks of angina* came on with great violence and with only a few seconds' intermission during the entire night, without any real sleep. For the next two days the attacks were unusually frequent and severe. It is true that the occurrence of these symptoms may have been only a coincidence, and Müller (*Therap. Monatsh.*, August, 1888) claims that this is proved by the fact that in a case of arterio-sclerosis in which he used sulphonal no unfavorable action was observed. This is, of course, only negative proof. Burnett (*loc. cit.*) reports a case of arterio-sclerosis in which the patient became cyanosed and semi-comatose for twelve hours after taking it. He believes it to be contra-indicated in this condition. Lovegrove (*loc. cit.*) has also witnessed cyanosis produced by sulphonal, as has been already stated.

5. Finally, the *uncertainty of hypnotic action* is one of sulphonal's disadvantages,—a fault which it shares more or less with all hypnotics. Cases of failure of action on the part of sulphonal are too numerous in the literature to allow of quoting from them. Among those who have been unfavorably impressed by the drug on the ground of its inefficiency may be mentioned Wilson and Hutchinson (*Med. and Surg. Reporter*, June 9, 1888), Lovegrove (*loc. cit.*), Salgo (*Wien. med. Wochenschr.*, No. 22, 1888), and Regis (*Journ. de Méd. de Bordeaux*, July 1, 1888). Several of the cases I have reported might serve as examples, but

the following are perhaps still better illustrations of its occasional lack of hypnotic power, though given in full or even very large amount.

CASE XVI.—Mr. W. Fracture of spine. No pain, but persistent insomnia. 30 grains of sulphonal in the evening had no effect whatever.

CASE XVII.—Mrs. F. Paraplegia; persistent insomnia, and some pain. 30 grains at bedtime did not produce sleep.

CASE XVIII.—Mr. B. Cancer of face; insomnia independent of pain. Opium often used in full but not excessive doses. 40 grains of sulphonal at bedtime only made him drowsy and uncomfortable. On the next night the same dose was given and repeated at midnight. Even this large amount produced but little sleep, and the patient complained on the following day of dizziness and headache, and of feeling "queer." The same absence of beneficial action was observed after 80 grains given on another occasion.

The large majority of writers, nevertheless, pronounce favorably for sulphonal. My own experience with it has been for the most part satisfactory; for the number of cases in which no unpleasant effects have followed or supplanted the refreshing sleep obtained by its use much exceeds the number from which I have reported examples here. The instances detailed, with those reported from the experience of others prove, however, that it is to be used with a proper appreciation of the bad results which may follow, that the time of administration is to be carefully determined, and that the dose should be accurately adapted to each individual case.

The chief disadvantages of sulphonal may, then, be recapitulated as follows: 1. Its hypnotic action usually develops very slowly. 2. This action is very liable to be prolonged throughout a greater or lesser part of the following day. 3. It is difficult to determine the dose which may be given with effect and with comfort in each individual case, and this dose may vary at different times in the same case. 4. The drug is liable to produce unpleasant secondary effects, which may even replace the primary hypnotic action. Chief among these are mental excitement, nausea, vomiting, dizziness, headache, languor, exhaustion, depression, and a staggering gait. These symptoms may appear either after large or after quite small doses. 5. It very often fails to exert any hypnotic action, either in any dose whatever, or in any amount which can be given with comfort to the patient.

Though I have expressed myself as in general favorably impressed with sulphonal, yet I confess to a decided preference for paraldehyde, and especially for amylene hydrate. With the latter drug my experience has been especially satisfactory, and disagreeable results following its administration are much less frequently reported in the journals than in the case of sulphonal. The objection that its taste is disagreeable is entirely removed by giving the full dose (45 minims) in 3 capsules of 15 minims each. It is especially to be preferred when a rapid hypnotic action is desired, or where there is not time to learn by repeated trial the amount of sulphonal suited to the patient in question. In cases, however, in which the stomach is irritable, it is probable that the latter will usually be more easily tolerated.

BRAIN WOUNDS, WITH EXCESSIVE LOSS OF STRUCTURE.

BY G. ARCHIE STOCKWELL, M.D., F.Z.S.,
PORT HURON, MICHIGAN.

(Concluded from page 237.)

THE two succeeding cases occurred in the practice of my father, Dr. C. M. Stockwell, and his associate and brother-in-law, Dr. Geo. B. Willson, and were likewise matters of personal observation to the writer, at the time a medical student. They are reproduced in condensed form from memoranda made by Dr. Willson, which, with the breech-pin in question, fell into my possession upon his demise.

2. June 4, 1869, Drs. Stockwell and Willson were summoned to S. W. B., a cabinet-maker, aged 22, wounded by a circular table-saw sixteen inches in diameter, with one-fourth inch "sett" of teeth. He was found at the shop where the accident occurred, seated upon a tool-chest, unsupported and unaided. Not more than fifteen minutes elapsed between the moment of injury and the arrival of the physicians. There had been considerable hemorrhage, judging by the clots upon his neck and stains upon clothing and floor, but this had been controlled by a workman's apron wrapped tightly about the head. He denied any sense of suffering or pain, save while coughing, which occurred in frequent persistent, hacking paroxysms, first beginning when he assumed an upright posture after the accident. He volunteered the information that the injury was received while in the act of withdrawing himself from beneath the saw table, where he had been engaged in adjus-

ing and tightening the belt connecting the pulley of the saw journal with another on a shaft beneath the floor; and thus, in some unaccountable manner, his head had been brought in contact with the revolving disk, that at the time was moving with a velocity estimated at from three thousand six hundred to four thousand revolutions per minute.

On removing the apron from his head, a wound seven inches in length, more than three inches in depth, and corresponding to the *sett* of the saw, was revealed, extending across the sagittal suture, dividing the longitudinal sinus, falx, and branches of the middle meningeal artery. Beginning at the superior temporal ridge of the left parietal bone, it reached diagonally across the head to a point on a level with the tip of the right ear. Coughing with each inspiration caused the cerebrum to shrink from the skull, admitting air beneath the dura, that, with each expulsive effort mingled with blood and produced a frothy fluid, which at times was hurled to a distance of more than a yard.

While cleansing the wound exteriorly, the cough suddenly ceased, but whether spontaneously, or as the sequel to a quarter of a grain of *morphinæ acetate*, administered dry upon the tongue a few moments before, is a matter of question and doubt. With a grooved director, the interior of the wound—the cerebral walls and bottom of the cavity—was carefully scraped, bringing away considerable quantities of bone-dust and crumbs, when the cut was packed with a well-oiled piece of chamois skin quadruply folded, and then closed, save at its most dependent extremity, with adhesive strips. Next the patient was conveyed in a carriage to his dwelling, five blocks away, and relegated to a bed in a cool room. . . .

Further details of the case are of little moment save to add, the head was dressed every three or four days, or as occasion demanded, during a period of six weeks, after which the patient resumed his former occupation. He at no time suffered from pain, and, aside from the morphine administered immediately after the accident, received no medication, except on one occasion *half* of a seidlitz powder. Shock was manifestly considerably less than would accrue to breach of muscular continuity of equal extent; and this will be observed to hold true of all open and sharply-incised wounds of the cerebrum. Two years subsequent to the accident, the man removed to central Ontario, and all trace of him was lost, though I was recently informed he yet lived, in full tide of health and possession of intellectual faculties.

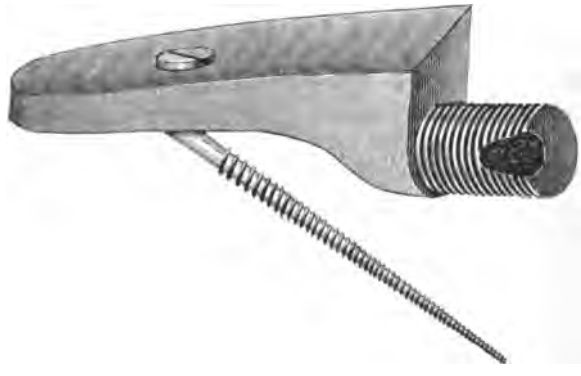
In the *North American Medico-Chirurgical Review* for January, 1858, an almost parallel case is reported by Dr. Ellerslie Wallace, of Philadelphia. The wound, inflicted by a saw similar to that in the case above noted, was four and a half inches in length by one-fourth in width, and extended horizontally across the skull along the coronal suture, lacerating the brain and dividing the longitudinal sinus. The patient, a girl of 10 years of age or thereabouts, recovered without a single untoward symptom.

3. On June 2, 1860, I accompanied my father and Dr. Willson to an adjoining county to see one Wilson Shaw, a farmer's boy, 20 years of age, who was reported to have had "a gun-barrel blown completely through his head." The accident occurred the day before, from careless firing of a converted flint-lock musket of the "Tower pattern," known to have been loaded for at least fourteen months.

The force of the blow felled young Shaw to the ground, but did not render him unconscious, for he immediately arose, and, unaided and alone, walked to the house, thirty rods away.

On removing the bandage, the left eye was discovered to be slightly protruding; the surrounding tissues bruised and ecchymosed; and the forehead, generally, blackened with powder. To the left of the median line appeared a large, irregular, and somewhat triangular-shaped opening, a trifle more than two inches long, and about an inch and a quarter in extreme breadth, the upper portion tapering to an obtuse point; the base of the triangle corresponded to the inner half of the superciliary ridge of the same side. From this opening disintegrated cerebral matter was slowly oozing, the man having lost, according to the testimony of the most conservative of the witnesses, "not less than six or eight heaping tablespoonfuls of brains." There was not, neither had there at any time been, loss of consciousness or evidences of paralysis. He made no complaints; his senses, naturally acute, remained unimpaired; the functions were undisturbed; and he denied suffering, except that the head felt "sore" and the left eye "slightly painful." His sole anxiety, apparently, was that a foreign body (which he believed to be a portion of the gun-barrel) be removed from its lodgment within the brain at a point he defined as "the middle of the head between the ears."

On pursuing the examination, the tip end of a screw was discovered just within the opening through the skull that extended back into the brain; and an attempt to remove it revealed its connection with some solid body beyond. By the introduction of a finger, a solid iron block, apparently the size of the little finger, was defined lying at right angles to, and penetrated by, the shaft of the screw, forming as it were a T. This second piece further appeared to lie in a slanting direction, upward and backward, the lower portion hooked behind the posterior edge of the roof of the left orbit, and the lesser wing of the sphenoid, in the middle fossa of the base of the skull; its point projected into the sphenoidal fissure, pressing upon the nerves and tissues of the posterior portion of the orbit, procuring protrusion of the eyeball and the pain complained of when traction was made upon the screw. The other, or superior, extremity of the block reached to the vertex, where it was solidly jammed against the under surface of the skull immediately to the left of the *falx*. Under the circumstances, every attempt to lift the lower arm from behind the lesser wing of the sphenoid, by employing the screw as a lever, proved futile.



Dr. Willson endeavored to push the screw upward and backward in order to tip the upper arm of the second body downward towards the occiput, and thus relieve the opposite extremity from its entanglement in the sphenoidal fissure. This also was a failure, however, as the point of the screw could not be pushed backward sufficiently to pass within the skull at the upper edge of the wound; it appeared to be firmly wedged in the solid with which it was connected, at or near its head.

After vain attempts to shorten the screw by means of such tools and appliances as were available, a V-shaped portion of the skull was excised at the upper portion of the wound, which then permitted the screw to be tilted upward and brought within the cranial cavity, thus relieving the second body, which, by being pushed backward, was disengaged, lifted from its resting-place, and removed. It proved to be the *breech-pin* of the gun,—a solid mass of iron of nearly five ounces weight, two and three-fourths inches long, five-eighths broad, and perhaps one-fourth thick along its posterior and flattened portion; the cylindrical or screw end of the breech-pin where it entered the barrel was five-eighths of an inch in diameter and nine-sixteenths long. The screw that passed through the pin was two and seven-eighths inches long, with an average diameter of one-eighth inch; and, at the point where it left the pin, it was bent to a degree that rendered it immovable save for slight rotation.

Pursuing the search in quest of other possible foreign bodies, it became necessary to remove fully a teacupful of disintegrated brain-substance; and in all not less than six or eight ounces by measure must have been taken away, including that lost the day before, if the estimates of attendants were at all reliable. And, at a depth of four and a half inches (actual measurement), imbedded in the left posterior lobe, were found two pieces of skull a trifle more than half an inch square, besides several smaller fragments and crumbs. During this time several experiments were instituted to determine the sensibility of the brain, which did not seem at all tender; but the patient, though blindfolded, was able to determine the nature of the substance or object introduced, by the sense of feeling, as accurately as he could have done by his finger-tips. A pair of blunt scissors he declared to be "cold and smooth, like polished iron or steel," and that the points rested "the least bit higher, but just midway between," the two ears. Even when the walls of th cavity were scraped to remove the last ves

tiges of bone and disintegrated brain-substance, he denied any feeling of pain, though he defined the act with accuracy. When surprise was expressed at the definiteness of feeling and perception, Shaw laughed heartily, remarking, "Why I can feel everything in there—just as plainly as if applied to any other portion of my body."

After cleansing the cavity, and edges and surfaces of the membranes, a plug of oiled lint was introduced, and secured by adhesive strips, in turn covered by a bandage. *Hernia cerebri* supervened towards the end of the first week, but this being freely excised, gave outlet to a considerable accumulation of pus, when no further difficulty was experienced; the patient was discharged four weeks later. Abandoning the occupation of farm-hand, he now became for a brief period a school-teacher, and subsequently and successively blossomed out as a phrenological lecturer, apostle of teetotalism, justice of peace, map agent, book canvasser, labor agitator, and saloon-keeper. He recently died in or near Grand Rapids, Michigan, from *mania-à-potu;* and the only mental aberration ever detected was a decided disinclination to live honestly, or to meet his lawful debts and obligations, the bill for medical attendance included.

4. In July, 1872, I was summoned to see a Norwegian laborer, æt. 42, who had received a transverse cut across the head and through the brain, extending from one and one-eighth inches above, and one-fourth inch anterior to, the left ear, to a point precisely opposite the tip of the opposite auricle. The wound was made by a band-saw bolted to the circumference of a horizontally-moving disk, twenty-seven feet in diameter, with a claimed velocity of two thousand revolutions per minute. This saw, employed to cut bolts into staves for wine-casks, had the general appearance, and somewhat of the application, of a trephine. The wound measured nearly eight inches in length, following the contour of the head, seven-eighths in average width, and from one and a half to two inches in depth, the scalp and brain being excessively lacerated at the most dependent extremity of the opening. Aside from what may have been lost at the moment of injury and before my arrival, above two fluidounces of disintegrated and mangled cerebral substance were removed. The case, which in general characteristics was very like Nos. 2 and 3, progressed favorably to recovery, save once, when, evidences of compression supervening, the brain was freely incised at the lowest portion of the wound, affording exit for a considerable accumulation of purulent fluid. Seven or eight months after the patient was discharged, he died suddenly from the effects of a prolonged and severe alcoholic debauch; and an autopsy failed to reveal any cerebral complication. On the contrary, the brain was completely healed, and every way normal, giving no evidences of injury; and but for the evidence afforded by the cranial vault, it would have been difficult for a stranger to locate the wound.

5. By an explosion in the dust-shaft of a flouring-mill, a splinter of pine, seven-eighths square and seven inches long, was driven into the brain of a lad 9 years old, entering beneath the left zygoma. The case was almost a parallel of Case 1, save in the character of the missile, and the fact that the splinter failed to penetrate the vertex. Removal of the foreign body was accomplished only with considerable difficulty, and followed by a copious discharge of blood and disintegrated cerebral matter. By keeping the wound open five weeks, a good recovery was made, though at one time, owing to neglect on the part of the child's parents, the tract became blocked, and an attack of encephalitis supervened that quickly yielded to treatment, when free exit was provided for accumulated inflammatory products.

6. This case, reported by Dr. Folsom, of California, exhibited a circular-saw wound extending longitudinally across the skull and dividing the parietal bone just to the left of the sagittal suture. It extended from a point on the frontal bone one and a half inches above the nose to a point below, and a little to the left of the occipital protuberance; was nine inches long by one in breadth, and two and a half to three inches deep. Recovery perfect, with no impairment of mental function.

7. A large dog, 4 years of age, was wounded by the premature discharge of a gun, the missile being a "green cartridge" of swan-shot (packed in bone-dust, within a copper-wire cage), that flies as a solid for a distance of about sixty yards ere the pellets are dissipated. It ploughed a groove three fingers deep and two broad in the anterior portion of the skull immediately above the eyes. For the sake of study and experiment, the unfortunate was not, as is usually the custom in such cases, "put out of his misery;" and with prompt and careful attention, wholly recovered, the cerebral portion of the wound healing by

granulation. Unfortunately, I was not able to determine the amount of brain-substance that was lost, though it must have been considerable. Exuberant granular points were touched daily or as occasion demanded, with silver nitrate, or acid chromic, and the entire tract always dressed with surgical oakum, maintained in position by means of a bandage and hood. There was never any manifestation of severe suffering. The accident occurred five years since, and the creature yet lives, apparently in good health, and no way different from other canines of his age and class, and is in considerable demand as a stock dog. I am also informed of a like accident occurring to a valuable brood mare owned by a brother practitioner, but have been unable to secure full particulars. The loss of cerebral substance is reported to have been considerable, however, and vision in the right eye completely obliterated. Since the injury the animal is accredited with better temper and greater tractability, which, perhaps, is less the result of changes within the brain than the lesson inculcated by the accident. She has given birth to four foals, the last in July, 1888; has been worked upon a farm, and at intervals driven both single and double upon the road.

As a matter of contrast, I present two more cases, the first a patient of my own, the other that of a brother practitioner, who kindly placed the same at my disposal.

8. The outlines of this case are almost exactly identical with those of his countryman as detailed in Case 4. The wound was in the same locality, inflicted in the same way (the sequel of careless curiosity), and by the self-same saw. Progress towards convalescence was every way favorable until the third week, when neglect to comply with instructions permitted the closing of the wound externally. I was summoned hastily one morning, only to find him writhing in a convulsion, and with all the symptoms of cerebral compression, which were almost instantaneously relieved by the thrusting of a finger-knife deep into the cerebral substance at the most dependent extremity of the wound, thereby affording speedy exit to a large accumulation of purulent fluid. A fortnight later I was again sent for, only to witness a repetition of the evidences found on the former occasion (I should say, I did not see the patient during the interval, as he went away without my consent or knowledge, and returned only the day before); but the prejudice of friends and countrymen assembled would not permit me to repeat the incision, and life lapsed a few hours later. An autopsy was obtained, however, which revealed two ounces of pus walled up within the cerebral substance.

9. A young man, 22 years of age, was wounded by the accidental discharge of a pocket pistol carrying a .22 bullet. The missile entered half an inch to the right of the median line of the forehead, and one and one-fourth inches above the superciliary ridge. For a time he did well, and resumed his clerical duties the fourth week following the injury, though the wound still continued to discharge pus in moderate quantities. Suddenly *hernia cerebri* appeared, and his medical attendant, following the teachings of his *alma mater*, of text-books, and the advice of counsel, feared to resort to any measures looking to relief except the authorized *repression by pressure*. The cessation of the discharge was coincident with the development of the hernia, and was succeeded by evidences of compression, in turn followed by death. *Because the pus was surrounded by cerebral tissue, the patient must needs be allowed to die in obedience to an absurd fetich!* The autopsy revealed two fluidounces of pus situate less than an inch from the opening of the wound, and consequently easily and safely accessible to the knife. The bullet, two inches farther back, was imbedded and encysted in the right posterior lobe, and its track obliterated, conclusively demonstrating that it was out of the way for harm, and no way immediately responsible for the untoward result.*

All these cases, fatalities as well as recoveries, fully illustrate the necessity in cerebral injuries, *first and foremost*, of providing for *free drainage*. Therein lies the secret of recoveries that, viewed in the light of the hour, were deemed little less than miraculous. In the very magnitude of the wounds and lacerations lay the elements of safety,—first, in the avoidance of concussion; and, second, a minimum of compression, it being local merely, instead of general distribution.

In numerous experiments undertaken upon lower animals, every case recovered promptly and readily when the wound was persistently kept open, permitting free escape of inflammatory products, and antiseptically treated, and with less detriment to general health

* Two other cases that will repay perusal may be found in the *American Journal of the Medical Sciences*, —that of Dr. H. D. Noyes, vol. lxxxiv. p. 45; and another, of Dr. Geo. Burr, same volume, p. 56.

than commonly accrues to wounds and injuries of other portions of the physical economy. Further, these experiments seem to conclusively demonstrate comparative freedom from danger in all brain wounds, within certain limits, where they are accompanied by free openings into the cerebral vault; also that they, as a rule, are *less fatal* and more amenable to surgical measures in proportion to the loss of tissue, there being exceptional freedom from shock, surgical fever, and reflex phenomena, than breaches of muscular continuity, or fractures of long bones, providing the demands of sanitation (antisepsis and drainage) are fairly met. In all the cases that have come under personal observation the hemorrhage has been slight, or at least inconsiderable, as compared with the area of the lesion, and all exhibited large openings through or into the cranial vault and the meninges, with large suppurating surfaces, and great toleration towards the knife and curette.

By teachers and text-books generally, *hernia cerebri* is regarded as a *noli me tangere*. This, however, far from being true, is a mere *fetich*, which requires but little forethought to banish to the realms of superstition, where it rightly belongs. Reflection must convince the most sceptical that the "masterly inactivity" regarding surgical interference is a gross error resultant upon blundering misconception. For instance, Professor Chas. Nancrede, of the Philadelphia Polyclinic, while discussing the problem (?) of cerebral hernia, voices the opinion of the profession at large when he says,* "*The less done the better, as the cause primarily is loss of support.*" And, again, that interference "*must be avoided, especially when granulations are springing upon or around the protuberance, as we thus remove pressure and encourage growth.*" Atop of all this he insists upon resort to compression, with a view to forcing the mass back upon its matrix.

With such teaching as this, the impression must assert itself that those who voice and corroborate the fallacy have never chanced to observe the brain of man or other animal while in the full tide and vigor of life. Nothing is farther from the truth than the supposition the cerebral organ is a soft, pulpy, pudding-like mass, or a gelatinous substance, such as is sometimes found some hours after death. On the contrary, the brain is a firm and elastic organ, possessed of peculiar homogeneity. Its individuality is such that it everywhere leaves its impress upon the inner table of the skull during development, for it, instead of its osseous protection, gives form to the head. Again, the literature and discussions devoted to *hernia cerebri*, curiously enough, deal for the most part with *effects*, to the exclusion of *causes;* and physiology and pathology have been forgotten or ignored in anxiety to avoid responsibility and secure "*safe*" treatment,—all as the sequel of a primitive and barbarous superstition.

Let us look at this matter as it is, and not as superstition and fetichism teaches. *Hernia cerebri* is invariably the sequel of one of three conditions: First, a tumor composed wholly or partially of disorganized brain-substance; second, brain matter protruded by inflammatory processes within the cranial vault or cerebral tissue; third, exuberant or excessive granulations springing from damaged brain-substance.

Now, if the hernia is composed of disorganized tissue, certainly the economy derives no benefit therefrom. On the contrary, its retention proves a clog and detriment, since it promotes excrescence. It is probably irritative, hence the sooner it is disposed of the better, since removal checks or forestalls more grave disturbances that are sure to supervene.

If protruded by inflammatory processes, it is *prima facie* evidence of danger lurking behind, possibly due to accumulated purulent fluid as in two of the cases before cited;† and in such instance common, as well as surgical, sense dictates that an outlet should be afforded the pus, no matter if it is necessary to sacrifice a portion of the cerebral substance. As already shown, the brain is exceedingly tolerant of the knife, though, that it is imperatively demanded in all cases, is by no means certain, since aspiration might fully meet the indications.‡

Exuberant granulations are repressed by the free employment of the scalpel or caustics, in accordance with indications that demand their use, in other parts of the body; and it is a logical sequence that such should not be ignored or neglected merely because the tissue is cerebral, as all evidences prove the drain of sloughing is much less taxing to the economy at large than when derived from muscular substance. Further, the claim sometimes made that caustics are dangerous because of the greater absorbent power of the brain, is not at all tenable, and is not borne

* Ashurst, "International Cyclopædia of Surgery."

† Nos. 8 and 9.

‡ Drs. Fenger and Lee, of Chicago, report aspirating a cerebral abscess by means of a hypodermic syringe, with the happiest results (1887).

out by either facts or experience. A twenty per cent. solution of chromic acid, applied almost daily for a fortnight to granular cerebral substance, in case No. 7, failed to produce the slightest toxic effect. It is *meningeal* irritation and inflammation (not of brain-substance proper) that is to be feared and guarded against, and that is so productive of mischief in this class of injuries!

Again, cerebral hernia is never an immediate or early complication, as must needs be the case if the claims of Nancrede *et al.* were tenable. Instead, it is *invariably a secondary phenomenon attendant, commonly, upon suppurative and reparative processes.* All support has frequently been removed from considerable areas of healthy brain,* and without the slightest indication of closing, falling, sinking, protrusion, or other movement of the injured surfaces; and, in the case of the canine before alluded to,† above all others, there should have been collapse and protrusion of the cerebral walls, whereas the brain and wound retained their original forms and contours, save as modified by granulations, up to the period of convalescence. The missing portion of the brain was reproduced exactly in the same manner as in muscular tissue.

When hernia is found protruding from small openings, it affords indubitable evidence of considerable force in the rear, and consequently of compression, as in the case of the young man wounded by a .22 calibre bullet;‡ and this force is dependent upon powerful effort of Nature to free the brain from impending and fatal pressure, dependent upon accumulations of inflammatory, and consequently effete, products. The merest tyro in surgery does not need to be told that the compress would but illy compensate for the knife in furuncle, paronychia, or other abscess where pus is already patent to the eye and touch, and which embody none of the dangers that accrue to brain compression. Yet, in the face of these facts, and without any attempt to classify causes, we are told that upon accumulation of pus within cerebral substance (invariably the most severe and fatal of all forms of abscess, without the slightest chance for relief by absorption), the knife must ever be avoided, and compression instituted instead.

Further, hesitation or doubt as to the propriety of employing either the knife, aspirator, ligature, or cautery, as circumstances indicate, in each individual case of cerebral hernia, to my mind must be deemed reprehensible, to say the least; and, in the light of experience, I would have as little hesitation in excising or puncturing such hernia at its very outset, as in evacuating a felon or boil, or removing a wart. Witness the case of a girl, 13 years of age, wounded in the forehead by the discharge of a gun, as reported in the *Journal of the American Medical Association* for February, 1887, and the happy result that followed ligation and strangulation of a cerebral hernia;§ or consult the "Medical and Surgical History of the Civil War," where, in not a single instance (and several cases are cited by a surgeon, who appears to have been wise beyond his time) was there an untoward result.

In conclusion, let me remark that the experiences resultant upon intradural inoculation of lower vertebrates, in connection with the microbe theory and Pasteur craze, has direct bearing, and has proved of no little value, in the study and treatment of cranial wounds and cerebral injuries, and fully corroborate the assertion of Dr. Roberts, of Philadelphia, that trephining is attended with but trifling risk if carefully performed under antiseptic precautions,—"Less than the amputation of a digit or removal of a metacarpal bone." The comparative result of fatality is but *three* per cent. in the former against *four and one-half* per cent. accruing to minor operations, while the benefits afforded by the trephine are immeasurably overwhelming. All depressed fractures, all spiculæ of bone, all bullets or other foreign substance within or upon the brain, are perpetual menaces to life or reason so long as they remain. *Per contra*, the trephine has permanently relieved epilepsy and chorea of long-standing,—in a ratio of fifty per cent. as claimed. Insanity has fled before it, and the removal of extravasated blood, fibrinous clots, accumulations of pus, tumors of various forms and characters, and irritation and ultimately fatal compression avoided. Cerebral localization, supplemented by antiseptics and drainage-tubes, has opened up a new era in brain surgery and surgical pathology, and is the key that must eventually unlock the mysteries now attendant upon diseases of the central nervous system along with their attendant reflex phenomena, and banish from the pages of surgical science the last of many lingering superstitions that obtain regarding life and mind.

FEBRUARY 15, 1889.

* Cases 2, 4, 6, and 7.

† Case 7. ‡ Case 9.

§ Vol. viii. p. 150.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

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Leading Articles.

ANOTHER STEP TOWARDS THE PAUPERIZATION OF THE PUBLIC AND THE IMPOVERISHMENT OF THE PROFESSION.

DR. HENRY J. BIGELOW, of Boston, is certainly a widely-known surgeon of great ability and an able writer, and we suppose that in New England he has large influence. It is, therefore, a matter to be deeply regretted that his talents should be directed to the support of measures which certainly damage the general welfare of the profession. According to our thinking, the views which he advocates in the *Boston Medical and Surgical Journal* for April 18, although upheld by him with much plausibility, are not only incorrect, but are also very injurious to the public welfare and of sufficient importance to the general profession to require their public repudiation by every one who is in any way to be considered a representative of the profession. The question which is discussed by Dr. Bigelow is as to whether under any circumstances a member of the medical staff of public hospital should be allowed to charge for services; and he takes the broad ground that no such permission should be granted, even in the most extreme cases. His argument is, we think, fairly represented in the following *résumé:*

First.—The hospital is a charity, its funds having been given for charitable purposes, and its board of managers giving their time and talents to its administration without recompense: the record of a charity should always be kept without spot, and, as it is improper that a charity should be used for the aggrandizement, or for the pecuniary benefit of any one connected with it, the medical staff should not be allowed to charge for their services.

Second.—The hospital physician is already sufficiently paid for his services by the *éclat* which his hospital position gives him, by the experience which he acquires, and by various indirect recompenses which he receives, as is shown by the fact (to quote the words of Dr. Bigelow) "that these hospital offices would command a considerable premium in money from the best class of practitioners were they annually put up at auction."

After carefully reading the article by Dr. Bigelow, we do not think that these arguments gain force by his expansion of them. Their bearing is so plain that the baldest statement of them is, to our thinking, the most forcible. They are, however, of much less force than they seem, and are very easily answered, and we shall endeavor to put the answer to them successively as baldly as we have stated them. Such answer is as follows:

First.—The hospital is in its origin, and in its general scope, a charity; but it is not a charity to all of the patients that receive its aid (unless, indeed, the charity be at the expense of the medical staff). If a patient enter the wards of the hospital and receives gratuitous care, to him the hospital is a charity. If a patient pay a portion of the expense incurred for his care, still the hospital is to him a charity. If, however, the patient pays to the hospital more than the cost of his care, including the interest upon the original plant, then the hospital is no longer to him a charity; and, if it be tarnishing its record by allowing its staff under such circumstances to charge the patient, it is equally tarnishing its record as a charity by charging such patient more than it expends on him. Take the University Hospital of Philadelphia as an example. The actual cost of the patients of the hospital, inclusive of the interest for plant, is about seven dollars a week. It charges some of its patients twenty-five dollars a week. It is ab-

surd to claim that such patient receives the dole of charity, or that the institution is to him a charitable one. So far as he is concerned, it is a commercial enterprise, selling to him certain wares, so to speak, and receiving for them a good price.

Second.—It is true that the hospital physician receives great benefit from his position, and great indirect recompense; but this benefit—his experience, his reward—comes not from the rich patient, who takes a private room in the hospital, but from the patients who are in the wards of the hospital and who, receiving from the hospital charity, are entitled to demand gratuitous service from its staff. It must also not be forgotten that the rich man in the private room usually makes a much greater draft upon the time of the doctor than does the ward patient.

We are rather surprised that a man of Dr. Bigelow's position would take the ground because in his community by pitting doctor against doctor it is possible to obtain services free, therefore it is right to do so. The frightful competition in the profession leads to very bad results, and in a comparatively small community like Boston, with perhaps one or two large hospitals offering valuable positions, probably the best men will do anything to get the positions; but in our large cities the hospitals are becoming so numerous that there is sufficient competition for leading physicians and surgeons to make them treat members of the profession with some consideration.

To put the whole matter in a nutshell,—the hospital is a charity to its charity patients, and the hospital surgeon is in honor bound to treat such patients without charge; but the rich, who seek aid at the hospital, who pay to the hospital more than they cost it, are not charity patients, and it is an injustice to require the medical officers to treat them as such, even though the hospital has the power to compel such attention.

The hospital physicians and surgeons are, however, comparatively few, and they are usually sufficiently well taken care of, so that there is no reason why the general practitioner should weep over the wrongs which are done them; but the havoc wrought by hospitals, conducted as Dr. Bigelow would like them, would be with the rank and file of the profession.

To quote Dr. Bigelow's words:

"It should not be forgotten that the outside profession must be considered. When the advantages of a hospital, intended by the public as a trust for the poor, are so organized as to divert well-to-do patients from the outside profession who are not allowed to attend them there, they have a clear right to be dissatisfied:" now it is precisely such diversion of patients that Dr. Bigelow is striving for.

Human nature desires usually to get the most it can for its money, and the great mass of well-to-do people are either not sufficiently rich or sufficiently liberal to give to a hospital or a hospital physician, or to any institution or person whom they employ more than is demanded. The ordinary fee for a certain operation performed by the practitioner of a small inland town, say Roxbury, may be one hundred dollars; the same operation performed by the hospital medical magnate would cost two hundred dollars. The Roxburian, suffering from the malady, calculates: "I will have to pay fifteen dollars a week for four weeks to the trained nurse, and one hundred dollars to my physician, so that this whole thing at home will cost me one hundred and sixty dollars; if I go to Boston I will have to pay two hundred dollars for the operation, fifteen dollars a week for my nurse, and thirty dollars a week at least for board at a private hospital or boarding-house, making in all three hundred and eighty dollars. I will, therefore, stay at home and be operated upon." So publicly he affirms, "My own doctor is good enough for me." But the General Hospital—perhaps the Massachusetts General Hospital—says, "Not so, pay us the thirty dollars a week, and you shall have a private room, trained nursing, and the operation performed for nothing. In other words, pay us one hundred and twenty dollars, and you shall have your operation performed by the foremost surgeon of Boston,—shall get that which would cost you three hundred and eighty in Boston, and even at your own home one hundred and sixty." And so the Roxburian travels down to Boston, and the hospital, by defrauding its own surgeon, defrauds the general practitioner at Roxbury, and just so far injures the general profession. Ay, it does more than this; it pauperizes the rich man; it feeds that which grows by feeding,—namely, the spirit of obtaining services for nothing; it lowers the profession in the eyes of the public. And what does it gain? Ten or fifteen dollars a week towards the general fund.

Dr. Bigelow seems to think that there will be difficulty in drawing the line as to when

hospital physician should be paid; but only an idiotic board of managers could have such difficulty. It can only be necessary to make the rule that under no circumstances should compensation be received by the surgeon from the ward patient; but that when a person applies for a private room he shall be told that he must make arrangements with the visiting physician if he desire his services,—the hospital furnishing only the house physician, the necessary attendants, medicine, and board.

To show the absurdity of Dr. Bigelow's proposition, let us take it to its logical conclusion. A public hospital is built, we will say, with fifty private rooms. To attend to the sick in these rooms would require all the time of the visiting physician or surgeon, who would therefore get nothing for his labor. That this supposititious case is not a mere phantom is shown by the fact that in the University Hospital of Philadelphia there are now twenty-five private rooms, most of them filled all of the time.

Year by year the problems growing out of the relation of charity to the profession are becoming more important, and apparently more and more incapable of a correct solution. In England, if the journals are to be believed, much of the profession is on the verge of bankruptcy. The same mail which brought to us Dr. Bigelow's contribution brought the April number of the *Provincial Medical Journal*, containing an editorial upon the subject. Not long since another English journal, *The Hospital*, affirmed that by the introduction of the trained chemists and the trained nurses the demand for doctors has been greatly lessened. It says that "in acute and dangerous cases the morning, and in some instances the evening and mid-day, call will be needed as before. But in lingering and chronic illnesses, where the trained nurse is always on the spot to watch and to report, and to send a swift messenger in the event of need, the daily visit will give place to the biweekly, or even to the less frequent call. Of course when visits are fewer in number fees will necessarily rise, but they can never rise so high as to compensate for the more frequent calls of former days. The doctor's income, already far too small, must become still smaller, and his struggle for survival still more severe. In due time, however, the reward will come, and the public as well as the medical profession will share in its advantages. As frequent calls upon patients become less [illegible]able, and fees rise, the doctor will be able to live without such a tremendous strain and expenditure of energy as he is now compelled to endure. He will have both leisure and strength to do that without which the ablest man in the world cannot keep pace with the best progress of the times. He will be able to read and to study, and, what is as necessary as either, to meet his professional brethren in frequent and friendly conference and discussion."

This decrease in the demand for physicians must continually be more and more felt, and, as *The Hospital* states, there seems to be in England "but one result, possibly starvation for many and keen competition for all." This is the goal towards which such thinkers as Dr. Bigelow would lead the profession. Surely the *Provincial Medical Journal* is right in stating that "hospitalism, if it has to land the profession into such a state as above described, should be at once suppressed in the interests not of the profession, but of society at large."

In America we are fast travelling the road towards destruction, and, with the aid of Dr. Bigelow and his coadjutors, free medical services will before long be provided for all grades of society.

At the bottom are the ordinary dispensaries; a grade above these are dispensaries connected with the teaching institutions. The way in which the latter are carried on is well shown by an occurrence which took place at the University Dispensary some time since. *First act.* Enter, a well-dressed lady. "Good-morning, doctor. Why, I did not know you were here; I owe you a bill, and I might as well pay it now." *Second act.* Payment of the bill for his services, and further attention at the dispensary to the said lady by her physician without cost.

Next to the free dispensaries comes the newly-introduced pest, the Provident Dispensaries,—the medical bucket-shops,—which are just making their appearance in our Atlantic cities, apparently like the British sparrow,—bound to become domesticated and to be a great nuisance. In these the patient pays a small sum each visit, twenty-five cents, and thereby saves his or her conscience by making a pretense of paying, and defrauds some young or possibly struggling middle-aged physician of his small fee.

At the apex of the system is the hospital, as proposed by Dr. Bigelow, robbing alike the leaders and the rank and file of the medical profession. If this system continues, the time will probably come when every young doc-

tor will start his own free dispensary, and our cities will be full of medical bucket-shops,—a condition which seems to be already reached in Great Britain, as is shown by the following extract from an editorial, which we have ventured to take at length from a recent English medical journal:

"In a conversation with a very intelligent practitioner, he raised the following defence for shilling dispensaries: 'The whole evil,' he said, 'arises from the fact that a certain number of medical men are willing to give their services gratuitously. They carry on two kinds of practice,—receiving fees at their residences, and prescribing for nothing, not for the poor, but for all classes, at their hospital consulting-rooms. One system helping the other, the hospital appointment being really a stepping-stone to success. The hospitals are ruining the profession; for the authorities of institutions getting, what is the prime factor, medical advice for nothing, are utterly regardless of the general welfare of the profession at large; and, trading as they do, are careless as to whether the recipients of this free medical relief are deserving of it or not. . . .

"Humanitarianism and so-called philanthropy are largely responsible for the present position of affairs, whilst the teachers and lecturers, who tell students that 'they should be consoled for failure by the consciousness of the nature of their work,' have also a good deal to answer for. From successful men, who have raked in their pile, this advice savors too much of humbug to be swallowed except by Verdant Greens. What can young men do? They see the old and experienced at hospitals greedily appropriating the patients who might fall into their hands. They cannot compete on equal terms, or obtain adequate fees, so they meet the difficulty in this extraordinary competition by opening shilling dispensaries, to which people flock, in large numbers, and they make a living, where otherwise they would be compelled to starve.

"It is a matter of common sense. Young men are intelligent, and can now see that all this high talk about the nobility of the profession is arrant nonsense. Men must live and pay their way. They cannot exist under any other conditions but those which regulate all other professions; and finding the means in the shilling dispensaries, they adopt this system. How will it end? It will end by the establishment of all kinds of these institutions,—some for eye diseases and surgery, some for orthopædics and skin diseases; and in turn, the profession will be brought to such a pitch that the evil will cure itself, but by the very severe process of extinguishing the whole hospital system, which for over a hundred years has been like an incubus on the profession. . . .

"You want reform, but you must be fair and not press on those who are compelled *through evils, and not of their own creating* to take up this line of practice. You have my views, as you have asked for them. One other point. Ask the commercial travellers who go round about their customers. They will tell you that they receive the largest orders from the owners of private dispensaries, whose waiting-rooms are crowded and they also are good payers. In large towns, like Liverpool, the provident dispensary is a most lucrative system of practice. You don't agree with the system? Well, suggest a remedy. You will find that you will have a difficult task, unless you begin at the root of the evil,—the hospitals."

TREATMENT OF FOREIGN BODIES IN THE STOMACH.

A METHOD of treatment for foreign bodies in the stomach, which appears to be generally known and practised with the most uniform success in both England and the continent, consists in the administration simply of large amounts of potatoes, to which the diet should be restricted. It is stated by Professor Cameron, of Glasgow, that this plan, which, so far as we know, is almost unknown in this country, originated with the London pickpockets, whose custom it is to immediately swallow small articles of jewelry acquired in the pursuit of their profession, and then depend on their recovery through the evacuation which follows the abundant use of the potato diet. Several cases are on record where this method has proved eminently successful. Thus, Dr. Salzer (*Deutsche Medizinal Zeitung* for January 24, 1889) reports the case of a child who had swallowed a brass weight of three hundred grains in September, 1887, and in whom the physician was on the point of performing gastrotomy. According to Dr. Salzer's advice the child was put in bed, kept on the right side, so as to facilitate the passage through the pylorus, and then fed with as much potato, prepared in different methods to stimulate the appetite, as he could be persuaded to take. In five days the foreign body was evacuated in the fæces. He a

refers to a case of a patient who had swallowed a set of artificial teeth, and another who had swallowed a breast-pin one and a half inches in diameter, in both of which cases the foreign bodies were removed without difficulty.

At the meeting of the Society of Physicians in Vienna, at which the above cases were reported, the discussion which they stimulated led to the report of several other cases, one especially, by Hochenegg, which is especially remarkable in that it dealt with the case of a young carpenter, who, in 1884, swallowed a long nail, which was removed by gastrotomy. Two years later the patient was so unfortunate as to swallow a second nail similar in all respects to the first. The potato-cure was employed, and the nail was secured after nine days. In the *Deutsche Medizinal Zeitung* for March 11, 1889, Dr. Deichmüller refers to a case of a young girl, 10 years of age, who had accidentally swallowed a pin. Pain was complained of under the breast-bone, and Dr. Deichmüller, acting on the suggestion acquired through the report of the above cases, restricted the patient to the potato diet. Very shortly afterwards the pain disappeared from the chest and was felt in the stomach. Six days later it appeared in the right inguinal region; two days subsequently, having increased in severity, it was felt in the left inguinal region, while in the evening of this day the foreign body was evacuated with the fæces.

It is hardly necessary for us to call attention to the principles upon which this method is based. Potatoes, as is well known, are composed of nearly twenty per cent. of carbohydrates, eighty per cent. of the solids being starch and cellulose. On account of this large amount of carbohydrate, a great portion will resist the action of the digestive juices. The cellulose and other carbohydrates increasing greatly in volume from imbibition with water lead to an accumulation of an immense amount of indigestible residue; consequently the intestinal tube is, throughout the entire time of the administration of this food, filled with large masses of non-absorbable matter. The folds of the intestine become obliterated, and fixation of the foreign body in the intestinal tube is thus avoided. It is seen that from five to nine days, or even longer, are required for the evacuation of the foreign body, and in every case which does not seem desperate, a trial of this simple plan of treatment should precede resort to gastrotomy. In fact, at the recent meeting of the Vienna Medical College, Professor Billroth said that since the introduction of this procedure, gastrotomy for foreign bodies should become an obsolete operation.

EXALGINE—A NEW ANALGESIC.

UNDER the name of exalgine, or orthomethylacetanilide, is described a new analgesic, a derivative of the aromatic series, which was recently discovered by Brigonnet, and which formed the subject of an interesting communication to the French Academy of Sciences by Drs. Dujardin-Beaumetz and Bardet. Exalgine (*ex*, privative, and *algos*, pain) has the formula of $C_9H_{11}NO$, and is one of the three isomeric methyl derivatives of acetanilide (*Compt.-Rend.*, cviii. 571). It occurs in needles, or in long tablet-like crystals, according as it is obtained by crystallization or from the mass after fusion. It is sparingly soluble in cold water, quite soluble in hot water, and readily soluble in very dilute alcohol, or in water to which a small amount of alcohol has been added: it fuses at 101° C. As regards its physiological action, it seems closely allied to antipyrin, although its effects upon the sensorium are more marked than the latter, while it exerts a less marked action as an antipyretic. The characteristic results are said to be obtained after an administration of a dose of from 4 to 6 grains, given at once, or from 6 to 12 grains, taken in two doses in the course of twenty-four hours, the analgesic effect being claimed to be very marked in all forms of neuralgia, including visceral neuralgia, even being superior to that of antipyrin (*Pharmaceutical Journal and Transactions*, March 30, 1889). No gastro-intestinal irritation, rash, or cyanosis has been noticed after its administration, and it, therefore, would appear to be free from the disagreeable after-effects which appear in certain cases after the use of antipyrin and acetanilide. The toxic dose is stated to be 7½ grains for every two pounds of body weight, death apparently resulting from paralysis of the respiratory centre. It is noted that after the physiological effect of the drug has been developed, while painful sensations are destroyed, the tactile sense remains unaltered.

Exalgine is eliminated by the urine, upon the quantity of which it exercises a marked effect, acting like the antipyretics of the same group, diminishing the quantity of the secretion (*National Druggist*, April 15, 1889). In

diabetes it also reduces the quantity of urine and of sugar eliminated. Like all of the derivatives of the aromatic series it is antiseptic and antithermic, as well as analgesic, though the latter property is the more marked and may be developed in doses of less than half as great as antipyrin. The following are the formulæ for its exhibition, as given by M. G. Bardet in *Les Nouveaux Remèdes* for March 24, 1889:

1. ANTINEURALGIC POTION OF EXALGINE.

℞ Exalgine, ʒi;
Kirschwasser, ʒx;
Simple sirup, ʒi;
Distilled water, sufficient to make, ℥v.

Dissolve the exalgine in the kirsch-water and add the sirup and water. The dose is from 1 to 3 tablespoonfuls in the course of the day.

2. SOLUTION OF EXALGINE.

℞ Exalgine, ʒi;
Rum, ʒx;
Distilled water, sufficient to make, ℥v.

Proceed as before. The dose is the same as above.

METHACETIN—A NEW ANTIPYRETIC.

DR. FRANZ MAHNERT, assistant to Professor von Jaksch, describes in the *Pharmaceutische Post* for April 7, 1889, the most recent addition to our rapidly-growing list of synthetic medicinal compounds. This time it is an antipyretic, and in composition might be described under the name of para-acetanisidin, its formula being

$$C_6H_4 \begin{cases} OCH_3 \\ NH.C_2H_3O \end{cases}$$

This substance is a combination of the radical acetyl with anisidine, and is, therefore, an acetyl combination of the methyl ether of para-amidophenol. From the fact that para-acetphenetidin is commonly described under the name of phenacetin, the precedent is formed of describing this compound under the name of methacetin.

This substance occurs in the form of a powder, formed of slightly reddish scales, without odor; slightly bitter to the taste; soluble in warm water, to a less degree in cold water; while it is very soluble in cold and warm alcohol. It is not more soluble in acid and alkaline liquids than when neutral; its point of fusion is 127° C. From experiments made on animals, it was seen that methacetin, as might be expected from its analogy in combination to phenacetin, possesses the power of reducing temperature,—three, four, or five degrees being lost within a few hours after its administration. Doses of 45 grains given to rabbits are markedly poisonous, producing convulsions in the posterior limbs, then in the anterior members, as in the case of poisoning with antipyrin. Its action is principally exerted on the central nervous system, death being produced in rabbits by administration of only 45 grains. In doses of from 2 to 3 grains, given to children, it exerts a marked antithermic action, the reduction of the temperature being gradually produced, remaining for several hours at the lowest point, and then gradually increasing. Frequently marked perspiration is produced by its use within an hour after its administration. If the administration of the drug corresponds to the day of remission of the fever, the thermal fall is produced more rapidly, and has a longer duration than under other circumstances. The author has employed it in three cases of pulmonary tuberculosis, one of tubercular meningitis, and one of pneumonia, the patients in all the cases being between 6 and 13 years of age. In one instance it produced slight collapse, but never vomiting, ringing in the ears, vertigo, or erythema. The urine during the administration of this drug reduces the potasso-cupric test for sugar, but does not itself contain sugar, and there is no hæmoglobinuria. Methacetin, in one per cent. solution, prevents coagulation in milk and ferment. It seems worthy of further study.

THE REVISION OF THE PHARMACOPŒIA.

DR. ROBERT AMORY, President of the Convention of 1880 for the Revision of the United States Pharmacopœia, has, in accordance with established custom, issued an address or circular calling for the appointment of delegates to the convention to be held in 1890. He asks "the several incorporated medical societies, incorporated medical colleges, incorporated colleges of pharmacy, and incorporated pharmaceutical societies throughout the United States of America, The American Medical Association and the American Pharmaceutical Association, to elect a number of delegates, not exceeding *three*," and calls upon "the Surgeon-General of the Army, Surgeon-General of the Navy, and Surgeon-General of the Marine Hospital Service to appoint each, not exceeding *three* medical officers, to attend a General Convention for the Revision

and Publication of the Pharmacopœia of the United States of America, to assemble in the city of Washington, D.C., on the first Wednesday of May, 1890 (May 7) at twelve o'clock noon."

Dr. Amory further requests that the various bodies entitled to representation submit the existing Pharmacopœia to a careful revision, and transmit the result of their labors to the General Committee of Revision, at least three months before the meeting of the General Convention. It is also very desirable that every incorporated medical or "pharmacal" [*sic*] college, association, or society desiring to be represented in the Convention will send to him its corporate title and a list of its officers, addressed to the care of Dr. Edwin H. Brigham, Assistant Librarian of the Boston Medical Library, 19 Boylston Place, Boston, Mass., in order that he may prepare a list for publication.

We call the attention of our readers very earnestly to this matter, and sincerely hope that there will be a large and strong representation of the American medical profession at the Convention. The whole profession is, or ought to be, deeply interested in the Pharmacopœia, and we think that most of our readers will agree with us in believing that the last revision of the Pharmacopœia was not a complete success, and that this result was largely dependent upon the fact that the revision was left to so great an extent in the hands of the pharmacists.

Reports on Therapeutic Progress.

THE TREATMENT OF CERTAIN CASES OF CHRONIC URÆMIA BY MORPHINE.

At the meeting of the Medical Society of London, held April 13, 1889, DR. STEPHEN MACKENZIE read a paper on this subject (*British Medical Journal*, April 13, 1889). He prefaced it by depicting the suffering often witnessed in patients suffering from uræmia due to Bright's disease, and was sure any suggested treatment for the relief of the distressing symptoms would receive careful consideration and discussion, even if it ran counter to current teaching. He then narrated the following cases: Case I. was a woman, aged 38, suffering from chronic diffuse nephritis of some years' standing. There were anasarca, ascites, and breathlessness; the urine contained from one-half to two-thirds of albumen. The heart was hypertrophied, and there was double papillo-retinitis. She was treated for the renal symptoms with great benefit, and in about six weeks was free from dropsy and breathlessness, and was able to leave her bed. One evening, after unusual exertion in the afternoon, she was suddenly attacked by intense dyspnœa, with respirations fifty in the minute. The heart's action was weak, 150 to 200 per minute; she was cyanosed and covered from head to foot with clammy sweat. She was in a condition of mental excitement, with great terror of dying. She was treated with nitrite of amyl, alcohol, ammonia, and ether, without any relief, and then $\frac{1}{8}$ of a grain of morphine hydrochlorate was injected hypodermically. In a few minutes the dyspnœa became less urgent, in twenty minutes the patient was able to lie down, and on the following morning was in her usual condition. Several subsequent attacks were treated in a similar manner after the failure of other remedies. Morphine hypodermically and internally never failed to afford relief, and at no time were toxic effects induced. The patient died three months and a half after the first attack of dyspnœa of symptoms of chronic Bright's disease. Case II. was a woman, aged 28, suffering from granular kidneys of four years' standing. There was considerable anasarca, about one-third albumen in the urine, hypertrophy of the left ventricle, with mitral incompetency, and double papillo-retinitis. She suffered much from breathlessness and headache. After decided improvement for a time, she suffered from severe headache, nausea, breathlessness, and irregular action of the heart, and great sleeplessness. Chloral, bromides, nitroglycerin, and inhalations of oil of juniper were used without effect, or with little effect. Liq. morphine hydrochlor., ♏x, was then administered, with rapid alleviation of all the symptoms. It was repeated on many subsequent occasions with equal benefit, and with no drawbacks. The patient died of the combined effects of a carbuncle and the renal disease about two months after the treatment was employed. 10-minim doses of the solution of morphine always promptly relieved distressing symptoms; 5-minim doses were not sufficient. The author proceeded to point out the safety with which the morphine was given in these and other recorded cases. There was a deeply-rooted belief, possibly well founded, in the danger of opium and its alkaloids in renal disease. It was quite clear that this subject required further investigation; not only might morphine be given with safety in cases of uræmia, but with positive

advantage, as in the cases narrated. Next followed a brief consideration of the nature of uræmia, and it was concluded that: 1. Uræmia was a poisoning of the nervous system,—a toxæmia. 2. The poison was developed within the body of the patient,—autotoxæmia. References were made to the writings of Grainger Stewart, Dickinson, and Carter, and more especially to the researches of Bouchard, who had described seven toxic elements in the blood in uræmia. The principles of the treatment of uræmia were declared to be three: 1, the elimination of the poisons; 2, the counteraction of the poisons; 3, the prevention of the retention of further poisons. After discussing the first and last principles of treatment which should always be employed, he proceeded to point out that the value of morphine was to fulfil the second indication. The author next discussed the nature of uræmic dyspnœa, headache, and convulsions, and attributed the beneficial effects of morphine to its freeing the blood-vessels from the spasm induced by the poison in the blood. He referred to the writings of Loomis and his followers, and to cases recently recorded by Mr. Alfred Grace, where morphine had been administered in as large quantities as from ½ to 1 whole grain for a dose, by hypodermic injections, with the best results. He concluded by saying he thought enough evidence had been brought forward to show that morphine deserved further trial in uræmia. He did not recommend its indiscriminate use, and in the light of the asserted susceptibility of patients with disease of the kidneys to the toxic effects of opium, it would be given with eyes open to its possible danger. There could, however, be no doubt as to its immediate good in suitable cases, and it was probable more lasting good would result in cases of a curable kind.

The PRESIDENT said that morphine in uræmia was kept back as a kind of bugbear, and was always held to be contraindicated. He had met with plenty of cases in which it might have proved useful, but he had never had the courage to use it. He mentioned one case, however, in which it had been given before the diagnosis of eclampsia was made, and apparently with benefit.

DR. MACKENZIE said he was particularly anxious to hear of any cases in which untoward effects had been observed as following the effects of the drug in uræmia.

MR. BLACK asked whether there was any sugar in the urine.

DR. BEEVOR said that he knew of one case, at any rate, in which opium had had a bad effect. The patient was a man who was suffering from hæmoptysis, and it was not then known that he had Bright's disease as well. He was given about three grains of opium altogether, and in the course of twenty-four hours he died in a comatose condition. He was found to have granular kidneys. He said he supposed Dr. Mackenzie would not say that there were no cases in which morphine would do harm.

DR. FLETCHER LITTLE asked whether the author had any precise observations as to the state of the kidneys in the cases alluded to. He suggested that the effects which sometimes followed morphine might depend on the extent of degenerative changes which had taken place in those organs. He mentioned that, having had occasion to look up the text-books on the subject of the relative thickness of the cortex of the kidney, he had found serious differences in the measurements given. One authority gave three millimetres, while another gave nearly half an inch. His own measurements had led him to fix four millimetres as about the average.

DR. MACKENZIE, in reply, said it was quite clear that the spasm of the blood-vessels must depend upon abnormal contents. Dr. Beevor's case supplied exactly the sort of evidence he wished to collect. He quite believed that there was some foundation for a belief so generally received. He did not think that an advanced stage of kidney degeneration afforded the necessary explanation, since cases of uræmia were met with in which the kidney lesions were only of one or two days' standing. He expressed the hope that these cases and their history would encourage others to resort to this plan of treatment; and he was sure that they possessed in it the means of relieving suffering which was otherwise without a remedy.

THE ACCUMULATION OF THE BROMIDE OF POTASSIUM IN THE ORGANISM.

In the *Lyon Médical* for March 31, 1889, DR. MAURICE DOYON calls attention to a point in the administration of the bromide of potassium which appears to have been overlooked. It is well known that the bromide of potassium is eliminated very slowly. If a single dose of 15 grains of the bromide of potassium be given to a dog the greater part of the remedy will be eliminated within twenty-four or thirty-six hours, but a certain quantity will remain, and traces of it may b

detected in the saliva and urine for at least a month. Bromide of potassium is hence a remedy which accumulates in the organism, and when constantly administered, the quantity which is retained being gradually accumulated, may prove a serious danger to the individual. It would be interesting to determine in what organ this accumulation takes place, and the following observations published by Dr. Audry seems to mark the first step in this attempt. The case was that of a child twelve years of age who for more than a year had been under constant treatment for epileptic attacks complicated with acute mania. For more than a year bromide of potassium was administered in doses of from 55 to even 120 grains a day. In November, 1888, the patient was taken with scarlet fever, and although this disease progressed normally from the first day of the child's entrance to the hospital, the patient was attacked with epilepsy and maniacal excitement. In the intervals of the attacks the child was greatly depressed, did not speak and would scarcely eat, and remained absolutely inert in the bed. In the fear that this state of somnolence might be due to the bromide of potassium, the remedy was suppressed, but at once the convulsions increased in violence and appeared at so greatly reduced intervals that the drug had to be again given, this time administered in doses of sixty grains. After a few doses violent cough set in, which was so severe as to threaten suffocation; the temperature became greatly elevated and death occurred without the presence of any other symptoms except some râles in the lungs; there was no cutaneous eruption. At the autopsy nothing peculiar could be detected with the exception that perhaps the cerebral substance appeared a little harder than is usually the case,—and the lungs in a state of congestion; all the other organs appeared healthy. The attempt was then made to determine the presence and relative amounts of the bromide of potassium in the different organs of the body. In the brain 30 grains of bromide were found; in the liver 11 grains. It would thus appear to be warrantable to conclude from this analysis that the bromide of potassium tends to accumulate in the central nervous system and in the liver; but as to what extent the accumulation may take place before becoming dangerous cannot be stated,—and whether the great somnolence observed in this case was attributable to the accumulation of the drug, or to the effect of the remedy, is likewise unknown.

CLINICAL SIGNIFICANCE OF COLORLESS STOOLS.

At the recent meeting of the Royal Medical and Chirurgical Society a paper by Dr. T. J. Walker was read by Dr. Andrew Clark as to the "Clinical Significance of Colorless or Clay-colored Stools unaccompanied by Jaundice, their Connection with Disease of the Pancreas, and on the Part played by the Pancreas in eliminating Bile from the Intestines" (*Lancet*, March 30, 1889). After referring to the accepted views of the significance of clay-colored stools, the author gave particulars of two cases in which, during life, a persistent symptom was the absence of color in the fæces, and in which the diagnosis made of obstruction of the pancreatic duct, with a healthy condition of the bile-duct, was confirmed by the necropsy. From these cases he concluded: 1. That the formation of hydrobilirubin, the coloring-matter of the fæces, depended on the mutual reaction of the bile and pancreatic fluid, under the influences met with in the intestinal tract. 2. That in disease a deficiency of pancreatic fluid would, equally with a deficiency of bile, cause the pathological condition of colorless or clay-colored stools. 3. That, since, according to the most recent physiological researches, that portion only of the colored constituents of the bile which had been converted into hydrobilirubin was excreted in the fæces, while the unchanged bilirubin, bilifuscin, and biliverdin were absorbed, it followed that if hydrobilirubin could not be produced without the aid of the pancreas, that organ must have an important *rôle* in regulating what proportion of the bile entering the intestines should be absorbed and what thrown off in the fæces. Dr. Walker then pointed out that these conclusions received confirmation from the records of other published cases, that Claude Bernard recognized that the pancreas had a part in causing the color of the fæces, and that the state in which the bile pigments were found in the meconium of the fœtus, while the pancreatic function was in abeyance, also accorded with these conclusions. He further pointed out that the fact of the pancreas influencing the excretion of the bile in the fæces would, if accepted, reconcile the discrepancy between the clinical observation that certain drugs produced copious bilious stools, and the physiological observation that these drugs had little or no influence on the secretion of bile by the liver; and that the same fact would explain those hitherto inexplicable cases in which, with no evidence of

arrest of the bile-secreting functions of the liver or of obstruction of its ducts, the symptom of white or clay-colored stools was persistently present. In conclusion, Dr. Walker indicated the practical importance of the views he had endeavored to establish in the treatment and diagnosis of pancreatic disease and of all forms of bilious disorder.

DR. GEORGE HARLEY said that the paper required serious consideration, many points in it referring to matters proved, and many to others still doubtful. He quoted several instances which seemed to him to militate against the views as to the action of the pancreas which Dr. Walker had put forward. The meconium of children was only white in those cases in which the bile-duct is occluded; and in cases where a motion half black and half white was passed at the end of an attack of jaundice, the white part would be passed when the bile-duct was blocked, and the black part when it was patent, but the pancreas would be acting in both cases. White stools ought not to be so common as they were if Dr. Walker's views were correct.

DR. THUDICHUM acknowledged the instructiveness of the clinical cases, but thought the conclusions drawn were false. How was it proved that bile was eliminated from the intestine? Had bile been found in the fæces? Only a very small quantity of cholic acid had been discovered in the excrement of the dog, not one-twentieth of the whole secretion. Opium would produce colorless fæces, and the same thing occurred previous to an attack of epilepsy in a child; in these cases the bile-duct was not blocked. He had searched for hydrobilirubin in the fæces, and had not been able to find any. Human bile contained bilifuscin, and nothing else, and there was no proof that the pancreatic juice converted it into hydrobilirubin. So also the idea that calomel promoted a secretion of bile was false; calomel produced sulphide of suboxide of mercury, which colored the stools green. The blood never contained bile; it at once disappeared. The formulæ quoted in the paper had been all disproved; and according to Henle the average life of a modern physiological theory was four years; therefore no data more recent than this should be quoted as authority.

DR. PYE-SMITH saw facts in the paper which chemical criticism could not detract from. The two cases related were most instructive, and were far better interpreted by the explanation Dr. Walker had given than by any other. That complete obstruction of either of the ducts would produce white fæces was a new point. Dr. Thudichum's criticism did not touch the matter in question, for it mattered not whether the coloring matter were hydrobilirubin or not. It might be said that there was an *a priori* improbability that pancreatic disease caused absence of the color of the fæces, because the pancreas was singularly free from disease; stone in the duct was rare, as were also abscess or cancer in the head of the gland; the occurrence of undigested fat in the fæces was likewise rare. Icterus simplex was not explained by any physiological theory, and our knowledge was so incompletely established concerning the whole matter that we could not afford to put aside any explanation attempting to account for the causation of these cases.

MR. C. B. KEETLEY related a case of a man who died last year of cancer of the head of the pancreas, and who had obstruction of the pancreatic duct. The gall-bladder was enormously dilated with bile, and cholecystotomy was performed; notwithstanding the obstruction, at the necropsy the bile-duct was found quite patent. The fæces were always clay-colored, the man was jaundiced, and the urine was stained with bile throughout.

DR. WALKER, in reply, said he had dealt only with cases without jaundice, where there were pancreatic symptoms with absolute absence of liver derangement. He did not desire to dispute the question whether the brown coloring matter in the fæces were hydrobilirubin or not, and with regard to the startling announcement that bile was never to be found in the fæces or in the blood he confessed himself confused, and regretted that he could not look on these matters with the clear head of the physiological chemist. The urine in both the cases he had related was normal in color; normal bile was found in the gall-bladder and flowed into the duodenum.

EUGENOL.

The oil of cloves has for a long time been used as a local remedy for the relief of toothache; but no scientific investigation as to the actual value of the local application of this drug has yet been reported. Liebreich and Langgaard state that the oil of cloves applied to the uninjured skin first produced reddening and then anæsthesia. Recently DR. LEUBUSCHER has determined the presence in oil of cloves of an active principle, which he terms eugenol. He has

made a number of experiments as to the practical value of this principle, of which the following present his more important results (*Wiener Medizinische Blätter*, No. 8, 1889).

Eugenol is a clear, dark-yellow fluid; in its chemical composition allied to the higher phenols. In water it is insoluble, but readily soluble in alcohol and ether. It has an odor like the oil of cloves, and has also been described under the name of eugenic acid. If a drop of eugenol is instilled into the conjunctival sac of a rabbit, symptoms of irritation are first produced, the secretion of tears being increased, and the conjunctiva becoming somewhat reddened. After the first few minutes the sensitiveness of the cornea utterly disappears, while the conjunctiva is greatly depressed in sensibility, although not to the same degree as the cornea, the anæsthesia lasting for from ten to fifteen minutes. The deeper parts of the eye and the ciliary body are uninfluenced. In experiments to perform iridectomy in a rabbit under the influence of anæsthesia produced by eugenol, reaction occurred at the moment at which the iris was touched; while the division of the cornea was unassociated with any expression of pain. No after-effects, with the exception of slight reddening of the conjunctiva, followed the use of eugenol; the cornea remained unclouded. Similar results followed the application of eugenol to the conjunctiva of the dog, although the symptoms of irritation were here somewhat more marked than in the rabbit. The influence of eugenol was also tested on the mucous membrane of the lips, tongue, and gum of man, and at first produced slight burning, and then considerable reduction in sensibility, lasting from five to fifteen minutes. Complete anæsthesia could not, however, be produced by this remedy. On the mucous membrane of the female genitals there was slight reduction of sensibility, produced through the use of eugenol, it being more marked on the mucous membrane of the vagina than elsewhere. Applied to the uninjured skin, neither burnings nor reddening were produced, but slight reduction of the sensibility was produced in from five to six minutes. Although these results are not very striking, the author, nevertheless, tested the practical value of eugenol, and found that the best results were obtained when it was combined with a seventy per cent. solution of lanolin; [illegible]nt applied to the skin in eczema, it reduced the severity of the itching; second, in ocular surgery, the use of eugenol is not to be recommended, since in man the instillation of a dilute solution of eugenol into the conjunctival sac produces severe reaction.

THE MODERN TREATMENT OF ACUTE INTESTINAL OBSTRUCTION.

At the meeting of the Cambridge Medical Society, held February 1, 1889, Mr. Marmaduke Sheild, F.R.C.S., read a paper on this subject (*Lancet*, April 6, 1889).

After referring to the perils of purgative treatment, he passed on to consider modern methods, and said we still find that even with all our increased knowledge and improvements a large proportion of cases of acute intestinal obstruction perish. Diagnosis is ever uncertain. It may be said that probably an internal hernia exists, or that probably a gall-stone is impacted, and so on: but when the abdomen is opened, an unsuspected invagination is found. The fact remains that, with the exception of certain cases of invagination, no living man can with certainty diagnose the condition that really exists. The importance of searching for external hernia cannot be exaggerted. In the upper classes, in those who are obese, and in females, this precaution is especially needful. Even after examination a small rupture may not be recognized. To ascertain the presence or absence of mechanical obstruction, the medical attendant should bear in mind that there are three pathological conditions which closely simulate intestinal obstruction. The first of these is acute peritonitis, perforative or otherwise; the second, acute enteritis set up by irritating ingesta; the third, rotation of an ovarian tumor on its pedicle. The third and last condition urgently calls for abdominal section, and need not be further considered. Without dwelling upon the special symptoms of these cases, he remarked that in no one of them is there true obstruction. Fæcal matter and gas will pass if properly solicited by the aid of enemata. Copious enemata, then, are the first aids to diagnosis and treatment. In cases of acute obstruction the patient is in danger of dying from starvation. Nutrient enemata can be absorbed from the colon, and should always be employed. Meanwhile, opium should be given by the mouth, and is most useful when pain, and especially shock, are marked symptoms. The fallacious improvement in the case, which always occurs under opium, will not lull the anxieties of the judicious

practitioner, who knows that fatal strangulation is still persisting. Now if the symptoms of acute obstruction should be marked, and enemata, properly given, fail to do more than evacuate the contents of the colon, it may be concluded for certain that obstruction exists. Manipulation of the abdomen, with inversion of the patient and galvanism of the abdominal walls, may be tried. The sudden inversion of a patient on a sofa or hard bed, causing the intestines to roll towards the diaphragm, may pull out a coil of bowel from under a hand, or out of an unsuspected hernia. All these measures, however, must be done by the doctor himself early in the case, thoroughly and once for all. Now supposing all this has been practised and the symptoms still persist, an abdominal section properly conducted gives the patient a chance of recovery.

CAMPHORATED NAPHTHOL IN THE TREATMENT OF TUBERCULAR ULCERATIONS.

At the meeting of the Société de Thérapeutique, held February 27, 1889, Dr. Fernet read a short communication as to the properties of camphorated naphthol and indications for its use in the treatment of tubercular ulcerations (*Le Progrès Médical*, March 9, 1889). This substance is formed of a mixture of one part naphthol and two parts of camphor. It forms a greasy liquid readily applied to skin ulcerations and accessible mucous surfaces. Dr. Fernet recommends its use in the treatment of boils, ulcerations of the skin of the mouth, and in diphtheria. He reported numerous cases of buccal tuberculosis which though not cured were greatly ameliorated by this local treatment. In the discussion which this statement provoked several other members of the society confirmed the statements of Dr. Fernet as to the use of camphorated naphthol in such cases.

ŒDEMA AS A DIAGNOSTIC SIGN IN CARCINOMA OF THE STOMACH.

M. C. Baert, of Brussels, writing in *La Clinique* on cancer of the stomach, calls attention to the frequency with which œdema of the ankles is met with in this affection after it has lasted a few months,—a diagnostic aid which is by no means new, but is, he thinks, in danger of being too much overlooked at the present day. He gives a number of cases recently occurring in the various hospitals in Brussels in which œdema was present. In one of these cases the œdema came on as early as three months after the first symptoms of the affection made their appearance; in two other cases it was noticed after four months; but in most of the other instances it was delayed till the lapse of from six months to a year after the onset. In one case, where there was no evident cause to which to attribute the loss of appetite and the wasting complained of by the patient, Professor Carpentier, noticing some œdema of the ankle, diagnosed carcinoma of the stomach, and found his diagnosis confirmed by the appearance a month afterwards of all the usual signs of the affection. Several of the cases presented a marked increase in the nitrogen excreted in the urine. With regard to the deficiency or absence of hydrochloric acid in the stomach in cancer of that organ, M. Baert admits that it is usual, but agrees with Wolff and Ewald in saying that this sign is by no means peculiar to cancer, as it is found in other gastric affections.—*Lancet*, April 13, 1889.

THE PHYSIOLOGICAL AND CLINICAL ACTION OF SULPHATE OF SPARTEINE.

In the *Deutsche Archiv für Klinische Medizin* for March 14, 1889, Dr. L. Anton Gluzinski publishes an experimental and clinical essay as to the physiological action and therapeutical value of the sulphate of sparteine. His experiments show that sparteine owes its physiological properties principally to its action on the circulatory organs, this action being more accentuated in cold-blooded animals than in mammals, and more evident after direct application to the heart-muscle than after intravenous or subcutaneous injection.

The chief symptoms of its physiological action are the retardation of the pulse, with, in a less degree, an increase of blood-pressure. In mammals, with increasing dose, the action may be divided into three stages,—first, that of slowing of the pulse; second, less marked, an increase of the pulse; and third, a final reduction of the activity of the heart. These symptoms are explained as due to the action of the drug on the pneumogastric nerve and heart-muscle, the pneumogastrics being first stimulated, while later their irritability becomes decreased. Under the influence of sparteine the muscles lose their irritability, the latent period being prolonged; while the contraction increases in energy and the wave of contraction becomes longer; in the latter stage both energy and irritability of the mus-

cles become decreased. Through the action of sparteine the inhibitory centres of the heart are paralyzed, although sparteine is without influence on the peripheral motor nerves.

The influence on the spinal cord is manifested first by increase and then by decrease of its reflex irritability, while death is due to asphyxia, produced through action on the medulla oblongata, and paralysis of all the muscles of respiration.

In applying these results to the therapeutic use of sparteine, it is evident that only the first stage is of real value; in this stage the stimulation of the peripheral ends of the pneumogastric leads to the reduction in the frequency of the heart's action, with an increase of the blood-pressure, probably attributable to an increased energy of contraction of the heart-muscle. From comparative experiments made on dogs as to the relationship between the amount of the drug and the body weight, the author concludes that the dose for man, to produce this first stage of its physiological action, should amount to not more than 1 grain at most. Experiments made in the clinic of Professor Korczynski, on the other hand, do not entirely confirm this theoretical conclusion, since Dr. Korczynski found that small doses of ⅓ to ¾ of a grain produced a more favorable action on disturbed compensation of the heart than larger doses. He gives the results of his conclusions, made in this connection, as follows:

First, sulphate of sparteine undoubtedly exerts a favorable influence on non-compensated heart lesions; *second*, the action is rapidly evinced after the administration of sparteine in its action on the pulse and the improvement of the subjective symptoms; *third*, the rapidity of action of sparteine is its distinguishing characteristic, since it is much weaker in its effects than digitalis, and, in fact, in that regard is not to be compared with it.

As regards the therapeutic indications for the use of sparteine, its rapid action is the property which renders its use most valuable, and Dr. Korczynski would, therefore, recommend the employment of sparteine in the following cases: *First*, when dangerous or severe subjective symptoms in cases of non-compensated heart-disease it is generally preferred to waiting for the slow action of digitalis; sparteine may then be combined with digitalis to accelerate the production of the desired result; *second*, when digitalis is without action or when its administration is contraindicated on any grounds; *third*, the experiment seems rational as to whether the rapid action of sparteine might not produce a favorable result in angina pectoris.

SYPHILITIC FEVER RESEMBLING TERTIAN AGUE.

At the meeting of the Medical Society of London, held on April 1, 1889, a paper was read by Dr. Sidney Phillips on a case of syphilitic fever resembling tertian ague (*Lancet*, April 13, 1889). A woman, aged 27, a cabman's wife, with a previous healthy history, married in 1879; six months later her hair commenced to fall out; she had ulceration of the tongue and sore throat. Her first three pregnancies ended in miscarriages; she then bore four healthy children, and these were followed by another miscarriage. One of the children had died of whooping-cough, the others remained well. The husband had had syphilis six months before marriage, but the wife had not shown evidence of primary sore. In May, 1888, she was attacked with fever, accompanied by shivering and sweating, the attacks at first recurred every day, and then on alternate days. Ten days after her admission to hospital quinine was administered in 2-grain doses three times a day, and then 5 grains were given before the expected pyrexial attack. This at first checked the height of the temperature curve, but afterwards lost its effect, and an increased dose did not improve matters. At length iodide of potassium and mercury were given, which not only reduced the temperature, but also relieved the distressing headache and vomiting which had been present. The differential diagnosis from Hodgkin's disease, typhoid fever, tuberculosis, ulcerative endocarditis, pyæmia, and malaria were discussed. The question whether the pyrexia was associated with a local syphilitic lesion was raised, but no localizing evidence could be obtained. Erythema nodosum was present, and apart from syphilis it was rare to find this accompanied by fever. John Hunter and Fournier had described cases of syphilitic fever similar to that brought forward, but none so late as the ninth year after infection. These rare varieties of specific tertian fever occurred usually in females; the long duration of the pyrexia (eight months) was also a matter of interest.

THE ACTION OF FLUORIDE OF SODIUM.

In the *Archiv für Experimentelle Pathologie*, February 21, 1889, Dr. H. Tappeiner publishes an experimental essay as to the physiological action of fluoride of sodium, of which the following facts represent the more important conclusions. After doses of 7½ grains administered internally, and 2 grains given subcutaneously, for every two pounds of body weight, the following effects are produced.

First.—A condition of stupor and depression which is to be regarded principally as the result of the paralysis of the vaso-motor centres.

Second.—Convulsions which sometimes affect one limb and at other times the entire body, and in certain animals possess a distinctly epileptiform character. Occasionally they are so marked as to form the principal symptom of toxic action. In other cases, especially after the drug has been administered internally, they are but slightly marked. The convulsions are not reflex in character nor are they dependent upon the disturbance of the circulation or respiration, but are of spinal origin.

Third.—Paralysis of the vaso-motor centre.

Fourth.—Acceleration and deepening of the respiratory movements with subsequent paralysis.

Fifth.—Vomiting, and increased flow of saliva and tears, which may be arrested through the use of atropine.

THE TREATMENT OF TUBERCULOSIS IN AND NEAR JOINTS.

At the recent meeting of the Surgical Section of the Royal Academy of Medicine in Ireland, Mr. McArdle communicated the results of operative treatment in forty-one cases of local tuberculosis (*Lancet*, March 30, 1889). Of these, ten were instances of tendo-synovitis, twenty were examples of intra-osseous disease, and the remainder were cases of peri-articular and circumscribed articular tuberculosis. Of the forty-one cases, complete and permanent recovery took place in thirty-seven. In one case of tendo-synovitis, the first operation was followed by amputation; in one of trephining for central osteitis of the lower end of the tibia, the operation did not avail, as the articular cartilage was already perforated, and resection became necessary; in another of tubercular disease at the ankle, Syme's amputation became necessary; and in a case of partial arthrectomy of the knee, resection became necessary six months later, owing to the development and extension of a caseous centre in the inner condyle of the femur. In calling attention to some cases of arthrotomy, he said the following rules should guide us in performing this operation: 1. The incision should be made in such a position that arthrectomy, or even resection, can be conducted through it if necessary. 2. The incision should be sufficiently free to allow of complete removal of the diseased structures. 3. The incision should be in a position which will allow complete drainage. Neglect of any of these precautions may lead to much delay in complete removal of the diseased structures, generalization of tubercle, or sepsis.

URAL—A NEW HYPNOTIC.

Dr. Gustavo Poppi describes a product under the name of ural, formed by the combination of chloral hydrate with urethan, and recommends it as an excellent hypnotic which in ordinary doses produces a physiologically quiet sleep more rapidly and of longer duration than any of the other known hypnotics. He claims that its use produces no disagreeable accidents and in therapeutic doses no disturbance of blood pressure; if, however, poisonous doses are given to dogs under these circumstances reduction of blood-pressure is the principal mode through which its toxic action is expressed. No discomfort or distress is porduced on awakening from the sleep produced by ural, and Dr. Poppi states that its use may be persisted in for several days without inconvenience. He claims that he has given it in different cases of heart-disease, hysteria, and other nervous affections, in all cases with the best results, even when other hypnotics had proved ineffective.—*Wiener Medizinische Wochenschrift*, No. 22, 1889.

FURUNCULUS OF THE EAR.

According to the Paris correspondent of the *Lancet*, April 6, 1889, in an interesting work by Dr. Loewenberg, a well-known aurist, entitled "Therapeutical and Bacteriological Studies on Furunculus of the Ear," the author gives as the results of his investigations the following summary of his conclusions: 1. Furunculus is caused by a microbic infection proceeding from external media, the invasion taking place by the excretory ducts of the cutaneous follicles. 2. The successive appearance of furunculi in

the same individual proceeds from auto-contagion, which is effected by the transportation of cocci to the level of the cutaneous surface. 3. The same process may propagate the affection from one person to another or to several persons; furunculus is, therefore, contagious. 4. The entrance of microbes into the blood produces internal complications (metastatic abscesses) in certain cases of carbuncle, and even of furunculi, and often terminates in death. The author affirms that the micro-organism most frequently present in this affection was the staphylococcus albus, which was absent in one case only. The staphylococcus aureus and citreus were found equally often. In only one case were all three forms of staphylococci present together, and they were found in a certain number of unopened furunculi. Taking his stand on these researches, Dr. Loewenberg completely rejects the emollient treatment of this affection, which has hitherto been the classical one. He proposed, as long ago as 1881, to replace this treatment by another method, which is antiseptic or antibacteric, destined not only to abort the affection at its commencement but also to prevent its recurrence. This he effects by the use of saturated solutions of boric acid and alcohol, which he drops into the ear in cases of otorrhœa, and in cases of unbroken furunculi he employs a supersaturated solution of boric acid in alcohol, from which the author has never experienced any bad effects. Milder solutions, he says, are of little or no use in these cases.

Reviews.

DU LAVAGE DE LA VESSIE SANS SONDE À L'AIDE DE LA PRESSION ATMOSPHÉRIQUE; SES USAGES; SON APPLICATION AU TRAITEMENT DES CYSTITES DOULOUREUSES. Par Le Dr. J. M. Lavaux.

WASHING OUT THE BLADDER WITHOUT A CATHETER BY MEANS OF ATMOSPHERIC PRESSURE. ITS EMPLOYMENT IN THE TREATMENT OF PAINFUL CYSTITIS.

The above brochure is a description of a special instrument devised by Dr. Lavaux for injecting into the bladder various medicated fluids, and to be used in the treatment of diseases of this organ, more especially in cases of a painful nature. The apparatus consists of a reservoir, into which the medicated fluid is poured. This may be of any form, but it is essential to have it graduated, in order that the quantity of fluid injected may be noted. A rubber tube, one and a half to two metres long, and several nozzles. The special and important parts of the apparatus are the six nozzles, which are fastened to the end of the tube. They are made of metal, consisting of a tube three centimetres long, and have a lumen, measuring in the smallest one-third of a millimetre; the largest measures three millimetres; the increase in size for the other nozzles is one-third of a millimetre each. Over these nozzles is placed a conical-shaped rubber shield, which is the only part that comes in contact with the mucous membrane of the urethra. The method of using the apparatus is, first, to place the fluid in the reservoir, and, forcing out the air from the tube, the nozzle, covered with its shield, is passed into the urethra. The patient lying upon his back, the fluid is permitted to flow into the bladder. The proper height for the reservoir is about one and a half metres above the patient. As soon as the patient feels the desire to urinate, the nozzle is removed from the urethra, and he is allowed to empty his bladder; then the nozzle is again introduced, the fluid again permitted to flow into the bladder until the desire to pass water is again felt. This operation is repeated as often as is judged necessary.

The solutions vary according to the case. Usually it is recommended to begin with boracic acid, employing a saturated solution. In very obstinate cases a solution of nitrate of silver is also used, and where the pain is excessive the injection of a four per cent. solution of muriate of cocaine is first thrown into the bladder, and allowed to remain three or five minutes, when the other solutions can then be injected. The temperature of the injected fluids should be from 100° to 104° F., when placed in the reservoir.

Many cases, of different lesions of the bladder and urethra, are given by Dr. Lavaux, in which his method of treatment has been employed, and the results have been so very favorable that he believes they could not have been obtained by any other means of treatment. A few of the conclusions arrived at, from the author's experience, are,—that it is possible to wash out the bladder, by means of atmospheric pressure, without using a catheter, when his instrument is employed; that if his instructions are followed out, the operation is very simple, easily done, and absolutely harmless; that thorough antisepsis of the urethra and bladder can be obtained, thus lessening very much the risks of operations in this region; that obscure fistulæ of the

urethra may be diagnosticated; that it is the most suitable method of treatment in all cases of cystitis; that anæsthesia of the mucous membrane of the bladder is possible in a few minutes by using a solution of muriate of cocaine.

Not only is this method of treatment of diseases of the bladder considered by Dr. Lavaux to be the most satisfactory in men; but also in women he has found it much superior to any other procedure in this class of cases. The application is the same with women as with men, except that it is not necessary to place the reservoir so high above the patient, and to place the whole nozzle in the urethra. J. H. C. S.

MASSO-THERAPEUTICS, OR MASSAGE AS A MODE OF TREATMENT. By Wm. Murrell, M.D., F.R.C.P., etc. Fourth edition.
Philadelphia: P. Blakiston, Son & Co., 1889.

The author is a thorough believer in his subject. He gives us the history of massage. More important to the reader than this, he gives us the method of performing it. This chapter is excellently illustrated, as it should be, with wood-cuts that tell the reader a great deal. The different methods of massage —the *effleurage*, the *pétrissage*, the *massage à frictions*, the *tapotement*—are all thoroughly and clearly described. Direct mechanical stimulation is explained, and the mode of application of the various methods to the various portions of the body, and to the varying indications drawn from the diseased condition of the recipient are dwelt upon at length. Dr. Murrell is an advocate of dry rubbing; even lanolin is inferior, he thinks, to rubbing without any lubricant. "The rubber who rubbed a hole in his patient because he had no vaseline, had mistaken his vocation." Whether inunctions are valuable *per se* is another matter altogether, nor is the character, education, affability, patience of the masseur or masseuse a trivial matter. "We cannot take John from the stable or Biddy from the wash-tub, and in one easy lesson convert either into a safe, reliable, or efficient manipulator." "Skill in the proper performance of massage takes at least two years to acquire."

The morning, Dr. Murrell thinks, is the proper time; nor need the patients rest in bed an hour after it. "The sooner they go about their business the better." Nor should it be too long continued at one *séance*.

"The practice of massage," the author remarks, "has preceded the theory;" but he endeavors to formulate some theories of his own and other investigators. The question of the true physiological action of the process he considers an involved one. To guide us we have the observations of Gopadze, Zabludorski, and Von Mosengeil. The experiments of these observers and their results Dr. Murrell carefully studies, and proceeds to detail the methods of applying massage in various specified disorders,—paralysis and nervous affections in general, constipation,—in which he regards massage as holding out almost the only hope of permanent cure,—hemorrhoids, intestinal obstruction, profuse defecation, gall-stone,—of the relief of which he gives numerous clinical cases, — dyspepsia, corpulence,—where he considers it "of very great value,"—rheumatism and rheumatoid arthritis,—and his chapter on this is exceedingly able and suggestive, going, as he does, into the rationale of massage,—malassimilation, neurasthenia, —in regard to which he coins a new word, "Weirmitchellism," as a tribute to Dr. Mitchell's work; in fact, the list of diseases benefited by massage, according to Dr. Murrell, might be almost indefinitely extended, and, better still, he apparently proves his case, and has experience and observation of actual results to support him triumphantly. He quotes Dr. Maclean, of Netley, in support of the opinion that even acute diseases, as intermittent fever, are greatly benefited, and shows its value in cases of poisoning and its method of application. The reader, and the careful, conscientious reader alone, will understand the real value of Dr. Murrell's work and profit by it, and we can do no better than advise all except experts to begin its perusal. E. W. W.

A SYSTEM OF GYNÆCOLOGY. By American authors. Edited by Matthew D. Mann, A.M., M.D., etc. Vol. II. Illustrated with four colored plates and three hundred and sixty-one engravings on wood.
Philadelphia: Lea Brothers & Co., 1888.

So very extensive is the scope and design of this work that we find a very minute division of topics and come into possession of articles on subjects, the bearing of which upon gynæcology we can at the first glance scarcely understand. All that could be said of the previous volume applies to this second one. It presents us with a similar array of excellent monographs upon gynæcologic topics, from the pen of writers of experience and acknowledged reputation. Among the contributors we find Drs. Battey, Bak

Busey, Emmett, Englemann, Goodell, Gross, Jenks, Howard A. Kelly, Chas. Carroll Lee, Lusk, T. Gaillard Thomas, and many others. It would be hard, among so many excellent articles, to name any as especially brilliant, deep, or valuable; but perhaps general consent would recognize the chapter by Dr. S. W. Gross on "Tumors of the Breast;" that on "Diseases of the Bladder and Urethra," by W. H. Baker; Dr. Emmett's article on "Lacerations of the Cervix Uteri," and "The Treatment of Ovarian and of Extra-Ovarian Tumors," by Dr. Wm. Goodell. Among the articles on more limited subjects is an excellent one on "Fistulæ," by Dr. Edward W. Jenks; "Diseases of the Fallopian Tubes," by Henry A. Coe, M.D.; and the book concludes with "Displacements of the Uterus," by Geo. T. Harrison, M.D.,—a very unique article,—the only one, perhaps, extant in which, from beginning to end, though illustrated, is to be found no portrayal of a pessary of any shape.

The possessor of the "American System of Gynæcology" might—if he were oblivious of the signs of the times—reasonably hope that he had at last obtained a complete text-book on the subject. He might, if of feeble intellect, be lulled into a false security, and imagine that science and art, minuteness and elaboration, had done their best or their worst, and that he might turn his attention and his purse towards improving his library in some other branch of medicine; but, alas! with the new season will come new discoveries and new writers, new systems and new encyclopædic works, though the signs of the times do seem to point towards an arrest in gynæcological progress. When any branch of surgical art finds itself day by day drawing nearer to that point where the total extirpation of affected organs becomes more and more a necessity, one may feel some hope that the end is near, and that some other field of medicine or surgery will next hear the huntsman's horn and be trodden down by the huntsmen.

E. W. W.

ILLUSTRATIONS OF ACUTE BRIGHT'S DISEASE. By Francis Delafield, M.D. Part III. of Volume II. of "Studies in Pathological Anatomy."
New York: William Wood & Co., 1888.

In this division of his great work on pathological anatomy, Professor Delafield first gives the classifications of diseases of the kidney as adopted by various well-known authorities, and then takes up the consideration of acute Bright's disease, which he divides into acute exudative nephritis, acute degeneration of the kidney, and acute diffuse nephritis.

The first of these varieties is a simple acute inflammation of the kidney, which may or may not end in the necrosis of the renal epithelium. The second is described as acute changes in the kidney, characterized by the death of the epithelial cells of the tubules. This is the form which is especially produced by arsenic, mercury, and other poisons. The acute diffuse nephritis is said to offer the same lesions as have been described as belonging to exudative nephritis, but with two additional changes,—changes which are found in the earliest stages of the inflammation, and which give the characteristic stamp to the lesion,—first, a growth of connective tissue in the stroma; second, a growth of the capsule-cells of the Malpighian bodies.

We confess to doubting very much whether these different diseases really are distinct from one another, and are not simply different forms of the same thing. The distinctions between acute congestion and inflammation are always a distinction without a difference. In an organ like the kidney sometimes one, sometimes the other tissue, and sometimes various tissues together, may bear the brunt of a disease explosion, which explosions, after all, are of similar character. The most valuable part of the work are the numerous photogravures which adorn it. Some of these have the appearance of having been made directly from sections, but others of them are plainly not more than reproductions of drawings, of which character, indeed, probably are all the plates.

CHEMICAL LECTURE NOTES. By Peter T. Austen, Ph.D., F.C.S., Professor of General and Applied Chemistry, Rutgers College and the New Jersey State Scientific School.
New York: John Wiley & Sons.

AN ELEMENTARY TEXT-BOOK OF CHEMISTRY. By Wm. G. Mixter.
New York: John Wiley & Sons, 1889.

The author states in his preface that this book is not intended to be a text-book on chemistry, but simply a collection of notes on certain topics, which experience shows are frequently stumbling-blocks to the student. No order whatever seems to be followed in the arrangement of the topics, the subjects being grouped together in the most random manner possible, and it is evident that the entire course of lectures was delivered to very youthful classes. This, of course, is not a disadvantage, since the author's illustrations are on this account rendered very readily

comprehensible, although perhaps expressed in a somewhat verbose manner. The book is occupied with the general principles of chemistry, such as consideration of properties of molecules, laws of chemical reactions, the character of acids, bases, and salts, and other compounds, there being no consideration of the elements or specific chemical facts.

Professor Mixter's work is of a very different class from the above. This is a complete text-book of elementary chemistry, likewise designed for the beginner in chemistry, and it is thoroughly up to the times in knowing what to teach and how to teach it, and, more important still, what to omit. We hardly feel that the book requires further notice than to say that in looking through it we find nothing to criticise and much to commend.

Correspondence.

PARIS.

(From our Special Correspondent.)

How they use Sulphonal in France—Inulin in Artichoke-Heads—Coca Bad for Singers—Potassium Bromide Accumulation in the Brain—Antipyrin in Diabetes—Ethyl Cyanide is a Poison.

The subject of sulphonal was not exhausted in last month's letter, the physiological effects only having been considered. The pharmacological and therapeutical sides of the question, as viewed by Professor Mairet, of the Montpellier faculty, now require attention. His opinions deserve notice, not only because they somewhat differ from those of the American and German practitioners, but because they are supported by a considerable number of observations. The pharmacology can soon be disposed of. Sulphonal being tasteless, and insoluble in most menstrua, the powder is the best form to be administered, and it may be given suspended in almost any vehicle, from currant-jelly to plain water. As regards time, that to be preferred is two hours after the evening meal. The medicine being slow in acting, it must be thus given several hours before bedtime. The therapeutic effects were observed with insane patients, a restless class as a rule, numbering thirty-two, seven of whom were males. The product was first chemically examined by the hospital pharmacist, and found perfectly pure. With doses of less than 2 grammes (30 grains) sulphonal invariably failed, except once in the case of an epileptic girl. At the same time no after-effects were observed. With 30-grain doses, out of twelve cases, six were unimproved, two partially improved, and four only were afforded sleep. Not to give the particulars of each one of the successful cases, suffice it to say that in all sulphonal procured a six or seven hours' sleep, acted after the first dose, and, when the medicine had to be withheld, the sleep continued good for two nights after sulphonal was suppressed. The bad features were that from the second or third day the secondary effects became apparent, and kept daily increasing, so that the medicine could no longer be tolerated. The patients were affected like the healthy persons previously experimented with,—that is, they were in a state that can best be likened to the condition of a man after a long debauch. Next, 45-grain doses were administered in eleven cases, and in eight of them sulphonal acted successfully as a hypnotic. Some very restless patients thus procured deep and prolonged sleep. But the unpleasant secondary effects kept apace with the dose. During the day the patients would have vomitings, stay in a state of stupor, half-asleep and half-awake, and finally reach such a fit of depression and incoherency that the medicine could not be continued for more than three or four days. On stopping sulphonal, sleep would be good yet for a night or two, appetite would reappear, the feeling of drunkenness and irritation of the eyes decrease, and the patient become himself again. But at the same time night sleep would also be lost again. Finally, still larger quantities were tried with the three patients whom 45-grain doses had failed to quiet. As much as 60 and 75 grains were given to such refractory subjects, and this time they did get sleep, although one of them had vainly tried all the hypnotics of the Pharmacopœia and others besides,—that is, urethan, methylal, acetophenone, chloral, opium, and morphine. But to best describe their condition, after two days of the treatment they were, in the patient's own words, "thoroughly drunk." Of course the medicine had to be stopped, and of course also, one or two nights after, the patients were as restless and sleepless as ever. Dr. Mairet confesses he was becoming discouraged with sulphonal. But it was with regret he felt compelled to discard so valuable a remedy, answering the purpose as it does when all hypnotics have failed, never affecting the heart, and apparently sparing all internal organs. So, on pondering over the physiological properties of sulphonal, its slow action and cumulative effects, the idea suggested itself that perhaps a different mode of exhibiting would lead to better practical results. Since exper

ments have demonstrated that in man—to the contrary of what occurs with animals—the hypnotic action of sulphonal is the first to become manifest, the impression gained strength that the better plan would evidently be to first administer large doses for a day or two, and then the patient being well under the influence of the medicine, to continue with smaller doses. Experiments in this direction were made with twelve patients, some of whom had been given sulphonal before in 45-, 60-, and 75-grain doses, but in whom it had to be stopped on account of its secondary effects. A typical instance was that of Bo., a patient suffering from acute fits of dementia, accompanied with sleeplessness, and the same woman already alluded to as having tried all the known hypnotics. After she had recovered from the unpleasant secondary effects of the previous doses, she was, on January 23, given 75 grains of sulphonal. The ensuing night's rest was only partial, and during the day she complained of heart-burns and stomach heaviness; the same evening—that is, on the 24th—only 15 grains were administered. Results: a sound sleep during the night and no trouble during the day; good appetite. The three following days, same dose and same effects. On the 29th, the previous night having been less good, 60 grains were administered, but for the four following days only 15 grains, after which the 60-grain dose had to be repeated. The smaller doses were next found again sufficient. The other cases, treated according to the same method, afforded similar results, and consequently need not here be related in detail. The foregoing also explains the mode of administration recommended. Some explanations, however, are not unnecessary. Professor Mairet has called attention to the fact that the expression "large dose," at the beginning, must be understood to have a relative meaning. For some patients 30 or 45 grains will suffice, and 60 or 75 will be required for others. And, again, the smaller dose of 15 grains will answer during four days only with some patients like Bo., while with others the remedy will hold good for nine days before the higher doses have to be again resorted to. Another and last remark suggested by the experiments is that patients do not seem to become habituated to sulphonal, when it is given as just indicated.

A correspondent of the GAZETTE (Dr. W. W. Lane, February number, page 96) having called attention to the therapeutic value of the garden artichoke, it may be of interest to here mention that M. L. Daniel, of the Sorbonne Botanical Laboratory, has been investigating the same plant, chemically, and found its edible head to contain large quantities of inulin. The glucoside in question has been found before in many roots,—burdock, elecampane, and Jerusalem artichoke, for instance; but M. Daniel has observed its presence in the calyx of many flowers of the compositæ family, such as centaury, thistle, artichoke, sunflower, etc. None, however, exists in the cichoraceæ. As is well known, inulin is, chemically, a variety of starch, whose chief use in vegetable economy is to afford to the growing plant reserve food in a concentrated form. When the enormous flower of the artichoke has bloomed not a trace of inulin is left. So far the glucoside appears to have not been tried in therapeutics. But the plants where it abounds are used in medicine, and garden artichoke has some reputation here in rheumatism and gouty affections. M. Daniel attributes to inulin the peculiar flavor of the artichoke, plainly apparent in the *Cirsium palustre*, the *Onopordon*, the Jerusalem artichoke tubers, and the *Sylibum marianum*, which are edible. The same inulin is most likely also the active principle, not very potent perhaps, but not inert by any means.

A singular statement respecting the effects of coca on the voice has been made by Dr. Sandras before the Society of Practical Medicine. He says all coca preparations and cocaine, used either through atomizers, or in infusions and inhalations, have a disastrous action on the voice of singers. It is a great mistake, he thinks, to go on repeating that coca sharpens and strengthens the vocal cords, since, on the contrary, it will slacken and deaden them through the paralysis of the extensor muscles, as many singers have found out to their cost. And, to better illustrate the truth of his averment, Dr. Sandras stopped speaking for a moment, and before the meeting drank a tablespoonful of coca wine, swallowing it slowly and by small portions. Now, speaking again, his voice sounded much altered for the worse. The words were husky, low, and scarcely audible. The aphony thus produced, however, is painless to the speaker, if it is not to the listeners. It is also difficult to cure speedily, although chloroform inhalations appear to act as an antidote. If, after chloroform, tincture of benzoin and Norwegian tar, dissolved in turpentine, are used in inhalations, the patient's voice will be greatly improved, and to such an extent as to exceed in pitch and volume what it was before. The statement, it must be confessed, is a strange

one; but if it is inaccurate it can easily be disproved with very simple experiments.

The therapeutics of bromide of potassium are by this time well known. Yet one obscure point remains,—namely, what becomes of it in the economy, and which organ does it select in preference? In other words, is bromide of potassium a cumulative medicine? The elimination of the chemical is known to be a slow one. It has been observed, for instance, that as long as one month after the bromide has been administered small quantities of it can be detected in the urine. The question now is, Which organ acts as a storing-place for the chemical? Dr. Maurice Doyon, of the Lyons hospitals, has taken—as he modestly says—the initial steps in this direction, hoping others will follow up and complete his investigations, he having made so far but one observation. It must be remarked, by the way, the opportunities for such are but seldom met with. The case was as follows: An epileptic and maniacal child, age 12, who had been under treatment for one year at the Charité Hospital, died rather suddenly of scarlet fever. Bromide of potassium had been previously given almost all the time, in doses of 1 or 1½ drachms a day. The medication was the only one that afforded the patient any relief, and its temporary suppression once was followed with such an increase of severe fits that it had to be resorted to again. At the autopsy the brain was found somewhat indurated, but deserving otherwise no particular notice. Lungs congested; pus in the bronchia; kidneys and other organs healthy. As the child had been torpid and sleepy, it was thought advisable to examine the brain and liver for bromide of potassium. The analysis was performed as follows: One-tenth of the organ was taken, cut to slices, dried, and ignited in a platinum capsule; the soluble portions of the ashes were precipitated with silver nitrate, in the presence of an excess of acid, and the precipitate, consisting of silver bromide and chloride, was weighed. From this weight the constant proportion of chloride known to exist in the organ was deducted, and the remainder, reckoned as silver bromide, was calculated as bromide of potassium. Incidentally, it must here be remarked, that Dr. Doyon's chemical process is open to criticism. Qualitatively, the results may be admitted, perhaps. But for a correct quantitative estimation the chloride and bromide should have been evacuated, not by difference, but separately. However it may be, on multiplying by ten the numbers calculated, the brain was found to contain, in all, 1.934 grammes, and the liver .[illegible] gramme of bromide of potassium. As [illegible] first weighed fifteen hundred grammes and [illegible] second eight hundred, it follows that the pr[illegible] portion in the brain was much larger. Wit[illegible] out attaching too much importance to an is[illegible] lated and not altogether perfect observation, i[illegible] is certainly striking that bromide of potassium a brain-affecting medicine, should thus be foun[illegible] to accumulate in the very organ which is mo[illegible] acted upon when the chemical is administered.

A new use has been found for antipyrin. [illegible] an Academy of Medicine meeting Dr. Pas[illegible] spoke of it as effective—temporarily—in chec[illegible] ing the formation of sugar in diabetics. [illegible] might be expected, Dr. Germain Sée launch[illegible] into a warm eulogy of his favorite remedy [illegible] all the ills that flesh is heir to. But he was n[illegible] exactly endorsed by his fellow-academician[illegible] Dr. Robin thought, although antipyrin mig[illegible] be a useful makeshift in given cases to su[illegible] press for a while sugar-elimination, yet it is[illegible] dangerous medicine to continue for more th[illegible] eight or twelve days, as a gradually increasi[illegible] albuminuria will result. And even some p[illegible] tients cannot stand it so long. Besides, an[illegible] pyrin is not a specific for diabetes. As D[illegible] Worms observed, other substances—quinin[illegible] for instance—have been found quite as effe[illegible] tive. Arsenic will even succeed better and [illegible] tolerated longer, and so will opium, valeria[illegible] and potassium bromide. At the same time a[illegible] tipyrin should not be lost sight of, but only [illegible] a change of medication.

Although chemical analogy leads to the co[illegible] clusion that ethyl cyanide (hydrocyanic ethe[illegible] ought to be poisonous, some writers have mai[illegible] tained it is harmless. True, all cyanic co[illegible] pounds are not harmful, since the ferrocyanid[illegible] for instance, are not poisonous. Consequentl[illegible] each cyanogen combination should be judged [illegible] its own merits, a wise precaution, by the way, wi[illegible] most chemicals. Dr. L. Lapicque, on exper[illegible] menting with animals, has found ethyl cyani[illegible] to be deadly to rabbits in the minimum pr[illegible] portion of one grain to two pounds of anim[illegible] weight. The substance employed was of abs[illegible] lute chemical purity, and injected in the sha[illegible] of a watery solution into the aural veins. Th[illegible] symptoms were those of cyanide-poisonings i[illegible] general, with this important difference, ho[illegible] ever, that the effects are very slow, as long [illegible] two hours often passing before anything can b[illegible] noticed, even when three times as much as [illegible] deadly dose has been injected. This peculia[illegible] ity of the poison may have led former expe[illegible] menters into error. Ethyl cyanide was fou[illegible] still more effective with dogs, less than 5 c[illegible]

mmes to the kilogramme being sufficient in ir case, a result not to be wondered at, con- ering the sensitiveness of dogs to prussic d.

ARIS, April 19, 1889.

WIESBADEN.

(From our Special Correspondent.)

My presence at the Congress for Internal dicine, a meeting which annually unites leaders of German medical science, per- me to give you a short account of the cussion of one of the most important ques- ns in therapeutics, which alone occupied entire meetings of the Congress. The ject—that of the treatment of ileus—pos- es greater interest, since at this meeting discussion was not confined to the medi- aspects of the question, but was shared in a large number of eminent surgeons who e present. The results of the meeting not important from the discovery or re- t of new methods of treating this affec- , but from the fact, as we have already phasized, that when a body such as this rman Congress for Internal Medicine casts vote in support of any therapeutic meas- , especially one of such great importance, when this vote is nearly a unanimous one, ir conclusions may be regarded as em- ying the generally accepted opinions of the es; and in this instance they acquire espe- l weight from the fact of the union in the cussion of so many eminent surgeons, who, is unfortunately too rarely the case, in this tance agree with the clinicians in their nions. Space will not permit of my de- ing the discussion of this subject in its irety, and I shall, therefore, restrict my- to the salient points of the discussion.

The discussion was opened by Professors chtenstern, of Cologne, and Curschmann, Hamburg, the former regarding the aspect the question from the pathological point view, the latter confining himself to the rapeutic side of the question. Nothnagel, n Zeimssen, Leube, Türgensen, Fürbringer, osler, Schede, and others shared in the dis- sion of the problem, in whose solution each e of them was fitted through previous rk.

The characteristic feature of ileus—the test of the movement of the intestinal con- nts—is primarily produced either by some chanical obstruction in the intestines, form- the so-called mechanical ileus, or through [illegible] the propulsive power, forming the so-called dynamic ileus. Both of these causes may either alone, or when associated with each other, produce permanent arrest of motion of the intestinal contents. In the latter case, when a partial closure of the bowel is rendered complete through loss of propulsive power, we then speak of mechanico-dynamic ileus. The most frequent cause of dynamic ileus is acute or chronic peritonitis of the most varied origin, but most usually starting as perityphlitis. In this group belong the forms of ileus produced after wounds of the abdomen, after laparotomy and ovariotomy, cases in which, after successful reduction of strangulated hernia, or in which, after removal of constriction of the intestines by laparotomy, the signs of impermeability of the intestine still persist. The common cause which characterizes all the cases belonging to this group is the paralysis of a given part of the intestinal tract in which the intestinal contents collect, and the *vis a tergo* acting against an immovable obstacle may even increase the difficulty by forming obstructive twistings and knuckles in the intestinal tube. Every obstruction, even of short duration, as a consequence of the arrest of the movement of the intestinal contents, leads to an increased activity of the muscular walls of the intestinal tract above the constriction, and, as a consequence, hypertrophy of the muscular coats of the upper part of the bowel is produced. So long as this increased power of the upper part of the bowel is able to overcome the resistance at the point of constriction functional compensation may be regarded as having taken place.

The recognition of ileus produced by intestinal closure from other similar diseases is an easy one. Much more difficult is it to determine the position of the obstruction. In by far the majority of cases we must be satisfied with establishing the fact that an intestinal constriction exists, and that it is present either in the large intestine or in the small intestine. If in the latter, we can still further conclude that it is situated in the lower or in the upper parts of the small or large intestine. Only in rare cases may we succeed in obtaining special data as to the anatomical cause of the obstruction. Without doubt this uncertainty in diagnosis must greatly interfere with the success of our therapeutic treatment. If we, however, recall to our mind what was said above in reference to the pathological aspects of this affection, a number of data pointing to rational therapeutic measures will suggest themselves.

The two extremes of cases between which all possible combinations are possible are the following: Either an unimportant obstruction, with complete arrest of the intestinal movement, or active peristaltic movement associated with unsurmountable obstruction. Further, it must be recollected that, in the case of any obstruction of the intestine, there is arrest of the fluid and gaseous contents of the intestine above the occlusion, and collapse and emptiness of the intestinal tract below this point; as a consequence of this, great tension of the intestinal tube is produced, which, in its turn, leads again to a great increase of the intestinal movements, more and more gas and fluid are brought towards the point of occlusion, so adding to the tension, and so again in turn increasing the peristaltic contraction, until finally all other intestinal functions are arrested. Through the enormous distention of the intestine, and the corresponding reactive tension of the diaphragm and the external abdominal walls, the internal abdominal pressure is evidently greatly increased, the meteoristic intestine is pressed down towards the empty parts, and the parts concerned in the occlusion so surrounded on all sides by distended bowel, as in air-cushions, that every movement is impossible. When such a state of affairs has been reached, it is almost inconceivable that such an obstruction could be removed by internal means alone. And yet the state of affairs is more favorable than one would at first suppose. Experience teaches that in scarcely no category of these cases is cure through internal treatment absolutely to be excluded, although it is self-evident that the chances of cure will vary according to the nature of the obstruction. This is unmistakably proved by cases in which one and the same individual is several times attacked by ileus, perhaps three or four attacks passing away before death finally occurs, when post-mortem examination may perhaps show different obstructions which might have been regarded as absolutely immovable. Further, in many instances, the clinical symptoms absolutely establish the nature of the obstruction, and yet cure has resulted from purely internal medication. This conclusion is further proved by statistics, which show that almost one-third of such cases will result in cure through the use of internal treatment alone. Even among surgeons but a small number regard the time as having come in which all cases of ileus are to be treated by operative measures. Who can, however, to-day decide as to where lies the boundary-line which marks the limit of power of internal medication, and the point at which the domain of the surgeon commences?

The danger in operative procedures does not lie in the possibility of septic infection, for this danger has been overcome by modern surgery. It lies mainly in the weakness of the heart, which complicates the chance of every patient whose nutrition has been greatly reduced by ileus, and is the more to be dreaded, and will the earlier appear; the longer the operation lasts, the more manipulation is required, the greater the difficulty met with in the reposition of the intestinal coils. If one has the good fortune to make an early diagnosis as regards the situation of the obstruction, and the strength of the patient is such as to enable the danger of collapse to be set to one side, in such cases laparotomy may triumph. In other cases which are not so favorable and which allow but little chance for the success of internal treatment, the abdominal cavity may be opened and the obstruction rapidly sought for. Should success not crown this search, an artificial anus should be made and the abdominal wound closed. In certain of these cases the integrity of the intestinal tube may be restored a few days after this operative interference, or, should this not be the case, it may then be possible to so improve the condition of the patient as to enable him to undergo a more radical operation; but a great number of cases, especially in hospital practice, will offer no prospect of success from surgical treatment, and must remain reserved for internal therapy. This must consist of absolute diet and the administration of opium. The treatment with cathartics must be absolutely discarded, since it only tends to increase the peristalsis, which is already so dangerous a factor in the disease. At first, when the patient's strength has not been reduced, opium may be boldly given. Only in dangerous collapse is especial care to be taken in the adjustment of the doses.

Together with the opium treatment, which reduces peristalsis and abdominal pressure, may be combined the emptying of the stomach by means of the sound; this is not only to be regarded as a palliative measure, but often also exerts a true curative action, for if the stomach is emptied the tendency is for the intestinal contents above the point of obstruction to flow towards the stomach, so relieving pressure, and so perhaps entirely relieving

invaginated portion of the bowel. Gas-puncture of the intestine acts in a similar manner in relieving tension, and so tending to equalize the pressure above and below the point of obstruction. In carefully-selected cases and carefully performed the procedure is free from danger.

If the obstruction is located deep down, this may be relieved by copious enemata, or, still better, by the introduction of air through the rectum.

SULPHUR IN DIPHTHERIA.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—As you are in a great measure responsible for the production of this little instrument, I ask a space in your most valuable GAZETTE to recommend it to the profession, and through them to those for whose benefit it was produced. Some articles in the THERAPEUTIC GAZETTE last March, April, and May, on the use of sulphur in diphtheria, attracted my attention, and further clinical investigation convinced me of their correctness. In casting about for a means for the local application of this agent, and being tired of quills, glass tubes, and putty-blowers, I devised this instrument, one of which I send you.

It consists of a tube of brass, with a bent spoon soldered on one end. The spoon bent on itself; the whole smooth and without joints, in which poisonous substances might collect; nickel-plated and highly polished. It is to be used by passing it over the tongue, then pressing downward and forward. (I have found the patients, especially children, object much less to this action than they do to the pressure of an ordinary spatula on the middle of the tongue.) The powder then to be blown into the throat and on the tonsils by the mouth, tube of ordinary syringe, by compressing the bulb, or any other insufflator. It has proven a most handy instrument for the physician's personal use for office or bedside, used with any powder desired.

Now, going back to the question of sulphur, I would ask, What is the use of trying all sorts of unknown and uncertain agents for the destruction of microbes, when we *know* sulphur will destroy them. And if it is said that sulphurous acid is the agent demanded, and that the heat of the body is not great enough to convert the sulphur into this agent, I simply reply, that this condition must be in the sulphur itself, else *why does it do it?* If we want to kill the itch under the skin, we rub in sulphur. If we want to kill lice on birds, or *parasites* on beasts, we powder them with sulphur. When, after many years, investigation in search of an agent that would destroy the phylloxera that was destroying the vines and prostrating the grape industry in all parts of the world, and of which, in 1874, Professor Riley, of the Smithsonian Institution, in his reports of "Insects in Missouri," says, "Many remedies have been tried, but few are available in practical experience," what was it but powdered sulphur that proved the "microbe's relentless foe, and saved the industry," the vine, and the wines?

I fully believe that if the directions of the city boards of health as to sulphur fumes, printed and easily procurable, were known and followed in every family, and some appliance, like the one I have described, were at hand, and the powder of sulphur were used early and constantly in the throat, and taken internally, we might be able to stamp out this pest that is the cause of more sorrow and dread, and that destroys more young lives than almost any disease we have to treat, the scourge of the land and the dread of the physician.

Now to the use of my instrument. To be of use in the household it must be cheap, clean, and effective. It must be handy, and made of such material that it can be washed after using with boiling water, and so cheap that no one will hesitate to buy it. This one I have described is made so as to be sold by druggists for twenty-five cents, and so light that, until they keep it (which I hope will be soon), I will see that one is forwarded to any one who will send twenty cents in stamps.

J. D. OSBORNE, M.D.

NEWARK, N. J., 1034 BROAD STREET.

THE DOSE OF THE FLUID EXTRACT OF DIGITALIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In a paper, entitled "Three Cases of Valvular Insufficiency," by Dr. Kemper, in the March number of the THERAPEUTIC GAZETTE, p. 177, occurs the following statement: "The patient remained in bed for three days, during the first two of which she took 2-grain doses of bromide of caffeine, after that 10-drop doses of fluid extract of digitalis." The fluid extracts are concentrated preparations, and the fluid extract of digitalis is no exception to the rule, 100 cubic centimetres representing the therapeutic activity of 100 grammes of powdered digitalis.

The dose is 1 to 2 minims. I find that, under ordinary circumstances, 30 minims of this fluid extract is about equivalent to 50 drops, this being the average of a number of trials with different vials of the ordinary dispensing sizes. This would make a 10-drop dose of the fluid extract of digitalis about equivalent to 6 minims, an excessive and, under some circumstances, a dangerous amount. As Dr. Kemper communicates no information in regard to the number of such doses administered, or the intervals between them, his statement is liable to mislead the unwary.

Yours respectfully,

J. C. WILSON, M.D.

April 2, 1889.

Notes and Queries.

ANTIFEBRIN AS AN EXTERNAL APPLICATION.

DR. A. H. NEWTH writes in the *Lancet* for April 6, 1889, that he has recently been combining antifebrin with lanolin or vaseline, in the proportion of twenty grains to the ounce for an external application. He finds that in obstinate irritable ulcers it soothes the pain and subdues the inflammation; while in psoriasis, combined with some mercurial preparation, its results have been most excellent. He has also tried it in erythema, erysipelas, eczema, herpes, urticaria, and other complaints associated with considerable irritation, and has found it a most useful adjunct to other suitable remedies.

THERAPEUTICS OF BISULPHIDE OF CARBON.

Some observations on the employment of bisulphide of carbon, made chiefly in the Purísima Hospital, Santiago, South America, are published in the *Revista Médica de Chile*, and show that this unpleasant remedy may have more therapeutic power than it is usually credited with. It has occasionally been employed in this country for diarrhœa, and externally for ulcers. Sapelier also employed it with apparent advantage in typhoid fever, and it has been recommended in diphtheria and other diseases in which micro-organisms occur. The Chilian cases referred to included one of acute and one of chronic dysentery, one of atonic dyspepsia, one of simple gastric ulcer, and one of typhoid fever. The dose given was generally about two ounces of a saturated solution of the bisulphide in wate mixed with half a tumbler of milk or a litt sirup, taken half an hour or so before meal This very quickly relieved the pain and tene mus. In the typhoid case, which occurred i a child of 10 (not a hospital patient), who condition was becoming alarming, enemas a pint of water, containing about half a drach of bisulphide of carbon, were given, in add tion to the internal administration of iodide potassium and kairin. The diarrhœa dimi ished, the stools rapidly lost their offensi character, the gurgling disappeared from t iliac region, and the patient made a good r covery.—*Lancet*, March 23, 1889.

POISONING FROM HYOSCINE.

In the *University Medical Magazine* f April, 1889, DR. WM. A. CAREY reports thr cases, one occurring in his own person, which alarming symptoms followed the use $\frac{1}{100}$ grain of the hydrobromate of hyoscine.

TREATMENT AND CURE OF TETANU BY PILOCARPINE.

In the *Wiener Medizinische Blätter*, No. 1889, is a notice of three cases of traumat tetanus reported by DR. LUIGI CASA treated by the injection of the muriate pilocarpine, in all of which cure result The dose of the drug employed is not state with the exception that quantities of this dr may be used in tetanus with favorable resu which in healthy individuals and anima would prove fatal.

CAUSTICITY OF CARBOLIC ACID.

Some interesting details were given r cently by M. CARLES to the Bordeaux Me cal Society explanatory of the varying effe produced by solutions of carbolic acid up mucous membrane, according to the solve used (*Bull. Soc. Pharm. Bord.*, Februar p. 41). If carbolic acid be added to pur neutral glycerin, in any proportion up to any equal weight, a mixture is obtained which is tolerated for a long time on the epidermis of the hand without inconvenience, while the smaller proportions are borne even by the mucous membrane of the nose; but if the glycerin used be already aqueous, or if the mixture be diluted with water, it becomes ir ritant and caustic, and is no longer tolerat even by the skin. Considering that glyce

is an alcohol, and that phenol is also nearly allied to the alcohols, M. Carles inferred that when the two were brought together in a pure state a kind of compound ether is formed that is easily decomposed by water, the constituents then regaining their characteristic properties. This was confirmed by the behavior of a saturated solution of carbolic acid in ethylic alcohol, a drop of which left upon the hand for several minutes produced no unpleasant sensation or blanching of the skin; but immediately upon moistening the alcoholic spot with water there was produced a violent smarting, followed by a persistent reddening of the skin. M. Carles, therefore, suggests that in cases of burning with concentrated carbolic acid it would be better to remove the caustic with strong alcohol than with water. — *Pharmaceutical Journal and Transactions*, March 30, 1889.

ECZEMA CAUSED BY IODOFORM.

Dr. H. Campbell Pope writes in the *Lancet* for April 6, 1889, that he recently had under his care a case of inflamed bursa near the elbow-joint, which was opened antiseptically and dressed with iodoform gauze. A violent attack of eczema ensued, spreading over the whole of the limb. The eczema was cured by oleate of zinc ointment. The bursa, having filled a second time some months afterwards, was opened and dressed as before, with a like result,—namely, an attack of eczema. On discontinuing the iodoform gauze and dressing with oleate of zinc ointment, the attack soon passed off. On a third occasion, before the wound had thoroughly healed, the scab was accidentally removed. Iodoform ointment was inadvertently prescribed, and eczema appeared for the third time. It would seem in this case that iodoform was the exciting cause on each occasion of the eczema.

THE INCOMPATIBILITY OF SALICYLATE OF SODIUM AND ANTIPYRIN.

When antipyrin and salicylate of sodium in powder are mixed together an oily body is rapidly formed, which has by the end of twenty-four hours transformed the mixture into a pasty alkaline mass, in which the decomposition increases from day to day. Consequently antipyrin and salicylate of sodium should never be united in one capsule. However, it is stated by Vigier, in the *Gazette Hebdomadaire de Médecine et de Chirurgie* for March 29, 1889, that solutions of antipyrin and salicylate of sodium may be mixed and preserved indefinitely. No investigation as to the character of the decomposition which takes place when the powders are mixed has been published, and it seems hard to reconcile the fact of this decomposition occurring in the dry state when the solutions of the substances are permanent even after mixture. The subject should be certainly further investigated.

THE REGULATION OF DOSES FOR CHILDREN.

In prescribing for children one is often embarrassed as to the adjustment to the age of the child of the dose of the remedy indicated. Ordinarily the method of Gaubius is followed, which is given in the following table:

Child less than 6 months of age	$\frac{1}{20}$
Child less than 1 year of age.....	$\frac{1}{15}$ to $\frac{1}{12}$
Child less than 2 years of age.....	$\frac{1}{8}$
Child less than 3 years of age	$\frac{1}{6}$
Child less than 4 years of age	$\frac{1}{4}$
Child less than 7 years of age	$\frac{1}{3}$
Child less than 14 years of age.....	$\frac{1}{2}$
Child less than 16 years of age..	$\frac{2}{3}$

Young has reduced this table to a formula which is pretty generally adopted in the United States. Number of years plus 12, divided by the number of years, equals the required dose. Thus, at 2 years of age $\frac{2+12}{2} = 7$, meaning that $\frac{1}{7}$ dose should be given. It is thus seen that if the number of years plus 12 be divided by the number of years, the quantity will represent the denominator of the fraction, the numerator always being 1. According to this method the proportions of doses are as follows:

For a child of 1 year	$\frac{1}{13}$
For a child of 2 years.....	$\frac{1}{7}$
For a child of 3 years.....	$\frac{1}{5}$
For a child of 4 years.....	$\frac{1}{4}$
For a child of 7 years.....	$\frac{1}{2}\frac{0}{6}$
For a child of 14 years.....	$\frac{1}{1}\frac{0}{8}$

The opiates should be given in one-half the above doses, while purgatives may be given in double or three times the quantity. —*Revue Générale de Clinique et de Thérapeutique*, March 14, 1889.

MR. STANLEY ON ARROW POISON.

The letter from Mr. H. M. Stanley, which was read at the meeting of the Royal Geographical Society on Monday last, contained

an extremely interesting reference to the arrow poison employed by the natives of the Lower Congo district, and it afforded a curious insight into the strange perversions of knowledge by which the advances of civilization are retarded. Mr. Stanley says they were much exercised as to what might be the poison on the heads of the arrows by which Lieutenant Stairs and several others were wounded, and from the effects of which four persons died almost directly. The mystery was solved by finding at Arisibba several packets of dried red ants. The bodies of these insects were dried, ground into powder, cooked in palm oil, and smeared on the points of arrows. It is well known that formic acid exists in the free state in red ants, as well as in stinging-nettles, and in several species of caterpillars. This acid is, in the pure state, so corrosive that it produces blisters on the skin, and hence there is little ground for doubting that it was the "deadly irritant by which so many men had been lost with such terrible suffering." The multitude of curious insects encountered, which rendered their lives "as miserable as they could well be," bears out Mr. Stanley's idea that many similar poisons could be prepared from insects. It certainly is strange that, with the exception of cantharides, and perhaps of blatta orientalis, the insect world is so little used for active therapeutics.—*Lancet*, April 13, 1889.

A NEW MYDRIATIC.

Some recent researches upon hydronaphthylamine, by MESSRS. BAMBERGER and MÜLLER (*Berichte*, xxi. 1112), would appear likely to result in another useful contribution from the chemical laboratory to the materia medica. The compound in question bears the systematic name tetrahydro-β-naphthylamine ($C_{10}H_7H_4NH_2$), and appears among the other interesting physiological properties to be capable of causing the dilatation of the pupil of the eye in a remarkable manner. According to Professor Filehne, of Breslau, the instillation of a little one to five per cent. solution causes the dilatation of the pupil of the eye treated only; but dilatation takes place to a strong degree in both eyes as soon as a sufficient quantity—still very minute—has become absorbed in any way, as, for instance, after subcutaneous injection. The pupils are dilated wider than by atropine, and a pupil already dilated by a maximum dose of atropine is still further dilated by this substance. The physiological action of the tetrahydronaphthylamine is not identical with that exerted by the tropeines in the production of mydriasis, since, when applied locally, instead of paralyzing the contracting muscles of the pupil, as they do, it stimulates the nerve-endings with the dilating mechanism.—*Pharmaceutical Journal and Transactions*, March 30, 1889.

A HINT FOR FACILITATING THE MICROSCOPICAL EXAMINATION OF URINE.

When attempting to examine urine under the microscope for casts, epithelial cells, and other organic bodies, a good deal of annoyance and difficulty is sometimes caused both by urates, and also, when the specimen is not quite fresh, by fermentation and putrefactive products. In order to obviate this difficulty, and with the further view of preserving the specimen, DR. M. WENDRINGER advises that the urine should be mixed with a nearly saturated solution of borax and boracic acid. This dissolves the urates and keeps the urine from fermenting, and at the same time exercises no destructive effect upon the casts and epithelial elements which it is desired to examine. The solution is prepared by mixing 12 parts of powdered borax in 100 parts of hot water, and then adding a similar quantity of boracic acid, stirring the mixture well. It is filtered while hot. On long standing, a small deposit crystallizes out, but clings to the side of the vessel, so that it does not interfere with the transparency of the liquid. The urine to be examined is put into a conical glass, and from a fifth to a third of its bulk of the boracic solution added to it and agitated with it. The urine will be found to become clear in a short time,—*i.e.*, if there is no cloudiness due to bacteria; and it will remain unchanged for several days. If it is only wanted to clear the urine and to make it keep for a day or two, the addition of a smaller quantity of the boracic solution is sufficient. If a third of its bulk is added, no fermentation or putrefactive processes take place, even if the glass is left uncovered in warm places. Albumen, too, if it exist, is not coagulated. The organic elements—as epithelial cells, casts, blood-corpuscles, etc.—collect so quickly, without undergoing any morphological change at the bottom of the glass, that the first drop taken up by the pipette usually proves a satisfactory specimen.—*Lancet*, April 6, 1889.

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PROPHYLACTIC HYGIENE.

LECTURE X.—ON PROPHYLAXIS BY ALIMENTATION.*

By Professor Dujardin-Beaumetz, Paris, France.†

GENTLEMEN:—In previous lectures we have seen how man may preserve himself from infectious diseases by disinfection, isolation, vaccinations. It remains now to show that it is also in our power by a discriminating choice of the alimentary substances, which constitute our daily fare, to oppose in large measure the poisonings, infections, or toxi-infections to which we are exposed. This will be the subject of this lecture.

Foods may be the conveyers of a certain number of diseases, some eminently infectious and virulent, like typhoid fever and tuberculosis; others belonging to the group of parasitic affections, such as tænia and hydatid cysts; there are still others which are of a toxic character, and result from the presence of poisonous ptomaïnes. Lastly, we are able in cases of self-poisoning (auto-intoxication), resulting from insufficiency of the divers

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

† Member of the Academy of Medicine, Physician to Cochin Hospital, etc., Paris, France.

emunctories of the economy, by a special hygiene to diminish the dangers and retard the development of toxæmia. These are the points which I shall examine successively in this lecture.

But before taking up this subject, I desire, as briefly as possible, to point out the *rôle* which micro-organisms play in digestion. Already, in previous lectures, I have examined the bases of intestinal antisepsis, and have shown you the incessant production of toxines throughout the entire extent of the digestive tube, and their elimination by the urine and fæcal matters.

I have also told you that certain states of the digestive tube, and in particular dilatation of the stomach, or even constipation, favor the formation of these toxines and their penetration into the economy, and we are warranted in attributing to this kind of poisoning an important part in the phenomena, so strange and multiple, which characterize gastrectasis.

I have told you, moreover, that gastric embarrassment (ordinary "biliousness," acute gastro-intestinal catarrh) may be the effect of these poisonings, and that its treatment consists in neutralizing and expelling the toxines which have been introduced into the digestive tube, or which have formed there. I shall not return to these points which have been brought out in the previous lectures. But I desire to-day to call your attention to the favorable *rôle* of certain micro-organisms in the act of digestion.

Remark, first, that the buccal cavity contains a great number of microbes, some harmless or even beneficial, others harmful; and in a work published by Vignal this writer states that he has found in the mouth seventeen species of micro-organisms which act upon alimentary substances; some dissolve albumen, others gluten, others casein; certain of them transform starch into sugar, others invert cane-sugar.

Moreover, what takes place in the mouth also takes place throughout the entire extent of the digestive tube, and there are microbes which secrete diastases belonging to the same category as the other ferments; and just as the yeast-plant secretes sucrose, we see certain micro-organisms liquefy and peptonize albumen. Thus, the anthracoid bacterium, the vibrio of septicæmia, dissolve and liquefy gelatin, so that these microbes, which are so dangerous when introduced under the skin, might possibly play a useful part in digestion.

As Duclaux has well said, we may affirm that the good functionment of the digestive tube results from the equilibrium which exists between the regular secretion of the digestive ferments and the work of the micro-organisms. This equilibrium, it must be remembered, is often broken, for it may happen that the micro-organisms shall predominate, and this because they are not destroyed by the gastric juice, which has lost its acidity, or because too large a quantity has been introduced, or, it may be, because the residues of digestion, which contain them in abundance, have not been eliminated from the economy.

In other cases it is just the reverse which happens. There are not microbes enough, and there is an exaggerated production of digestive ferments. This is what happens in that special state which Professor Sée has described under the name of *hyperchlorhydria*. The exaggeration of the acidity of the gastric juice destroys the micro-organisms, and in this way disturbs the functions of the digestive tube and arrests digestion.

Let the equilibrium be broken by increase of microbes or increase of (chemical) ferments, and there results a symptomatic aggregate—a real systemic poisoning, of which gastric embarrassment (*embarras gastrique*) and hepatic congestions are the most frequent manifestations.

Do not forget the important *rôle* which the liver has in this penetration of the economy by the toxines produced on the surface of the intestinal tube. A gland, one of whose offices is the destruction of baneful alkaloids, the liver constitutes a real barrier against the entrance of these toxines into the general circulation, but their presence none the less determines a local irritation of the liver, which manifests itself by a congestion of that organ.

Duclaux rightly insists on the importance of certain fermented articles of diet as a part of the daily fare, basing himself on the utility of these micro-organisms in forwarding digestion. These fermented products bring with them their contingent of micro-organisms and of ferments to aid the digestive process. Examine the dietary of all nations, and you will always find certain products of fermentation included among their foods; hence the long recognized utility, from a digestive point of view, of old cheese, and sour-crout, always admitted to be more digestible than plain cabbage.

But if there are micro-organisms that are beneficial, there are others that are harmfu

and, as I have spoken of the buccal cavity, I must tell you that a great number of dental affections, and, in particular, dental caries, are of parasitic origin. The researches of Miller, of Berlin, and especially those of Galippe and Vignal, are in this respect absolutely demonstrative.* The latter writers have described six varieties of micro-organisms, all of which cause dental caries. This is not all. It is probable that a certain number of infectious diseases, as certain pneumonias, may result from the penetration of the air-passages by particular pathogenic micro-organisms sojourning in the buccal cavity.

Hence, from the point of view of prophylactic hygiene, we should insist more than ever on the necessity of buccal hygiene, and on the usage of antiseptic dentifrices. Among the various mouth-washes I am inclined to give preference to the following formula:

Phenic acid, 1 (gr. xv);
Boric acid, 25 (ʒvi¼);
Thymol, .50 (gr. viiss);
Essence of peppermint, gtt. xx;
Tincture of anise, 10 (ʒiiss);
Water, 1 litre (Oii). M.

Rinse the mouth, and brush the teeth with a little water containing an equal quantity of this solution, and do this once or twice a day after meals.

It would be a good plan if in our schools and in the army it should be made obligatory on pupils and soldiers to take the same pains in maintaining cleanliness of the mouth as of the hands and face.

I pass now to the main part of my subject,—namely, to the *rôle* which is played by alimentation in the propagation of certain diseases, and, in particular, of tuberculosis and typhoid fever.

Since the time that Villemin experimentally proved that tuberculosis is a virulent disease, contagious, and transmissible, and since Koch showed us the very contagious principle by his discovery of the tubercle bacillus, the attention of hygienists has been directed to the subject of the possibility of the transmission of tuberculosis by the use, as food, of the meat and milk of tuberculous animals. Let us examine separately each one of these points; first, that of meat; second, that of milk.

In the recent Congress for the Study of Tuberculosis, held in 1888, under the presidency of Chauveau, this question was long and keenly discussed, and I would refer those who desire a more intimate knowledge of the subject to the volume recently published concerning full reports of the proceedings.† The Congress adopted the following proposition formulated by Butel: "There is reason for the enforcement by all possible means of the general principle of the seizure and total destruction of all meats whose source is tuberculous animals, whatever may be the gravity of the specific lesions found in those animals."

The French government has given its sanction to this conclusion, for, by a decree bearing date July 29, 1888, it has placed tuberculosis among the diseases which come under the law of July 21, 1881, which regulates the sanitary police of animals.

To-day, then, the sanitary provisions of this law, applicable to tuberculous animals, are the following: The declaration of the animal as tuberculous, its isolation, the inspection of the sick animal by the veterinary appointed for the purpose, the exclusion of the meat from consumption if the tuberculous lesions are generalized; lastly, the interdiction of the milk of the diseased animals from consumption by man, although it is allowable to use the milk if it has been previously boiled.

Have we as yet a positive demonstration of the possibility of the propagation of tuberculosis by the flesh of diseased animals? Experiments in this regard are rather contradictory. While Nocard, on practising intraperitoneal injections in twenty-one series of guinea-pigs with the juice of the meat of twenty-one cows manifestly tuberculous, has obtained but one successful inoculation, Chauveau and Arloing, in two series, have had one positive result; and Saltier, out of twenty-one series, five positive results. Hence, while Arloing insists on the danger of tuberculous meat, and the frequency of the propagation of disease thereby, Nocard considers the fact as absolutely exceptional.

I am disposed to adopt the latter view. In fact, in the observations to which I have referred, the juice of the meat is introduced directly into the peritoneum, without having undergone the destructive action of the gastric juice and of the intestinal digestion. Moreover, this meat had not been previously cooked, so that the experiments in no way

* Gallippe and Vignal, "Note on the Micro-organisms of Dental Caries" (*Gaz. des Hôp.*, April 2, 1889,

† "Congrès pour l'Étude de la Tuberculose chez l'Homme et les Animaux, Première Session, 1888." Paris, 1889.

realized the conditions fulfilled in the ordinary dietetic use of meat.

The experiments of Peuch, of Toulouse, come nearer the reality. He gave to two pigs, aged two months and a half, five kilogrammes of raw meat apiece, the source of this meat being a cow known to have died of tuberculosis. He killed one of these pigs two months and a half afterwards, and found a few tubercle granules in a mesenteric gland. The other animal, killed three months afterwards, was exempt from any advanced tuberculous lesions; there were a very few tubercle granulations in the mesentery; all the other parts of the body were healthy.

Add that tuberculosis is much less frequent in animals than one would suppose. Since the application of the decree of July 31, 1888, to the slaughtering-houses of Paris,—*i.e.*, from the 1st of August to the 31st of December, 1888,—there entered the *abattoirs* twenty-four thousand seven hundred and twenty-four cows. (I specify cows, for these animals furnish not only their meat but also their milk, and I shall have to refer to these figures again when I come to speak of the transmission of tuberculosis by milk.) Out of these twenty-four thousand seven hundred and twenty-four cows, there were found one hundred and thirty-five cases of tuberculosis, which represents a proportion of .5 per cent.

Hence, then, by reason of the rareness of tuberculosis in animals and the destructive action of the gastric and intestinal digestion; lastly, owing to the preparation to which we subject our meat before eating it,—we reduce to the minimum the possibility of contagion, and the transmission of tuberculosis in this way becomes a very exceptional circumstance.

I may say the same of the transmission by milk, and although Legroux has affirmed that unboiled milk is frequently the cause of tuberculosis in children, I persist in considering this occurrence as extremely rare, and for the following reasons:

First, in order that milk may contain Koch's bacilli, the animal must not only be tuberculous, but it must have tuberculous lesions of the udder,—it must have tuberculous mammitis. Moreover, we must take into consideration the destructive action of the gastric juice on Koch's bacillus; lastly, the rarity of tuberculous cows.

You know that the name *pommelière* (bovine consumption) has been applied to tuberculosis of the cow; it has been affirmed that in the cow-stables of Paris, which are so numerous and often so badly managed, this disease is very frequent. Now, if we refer to the figures given by Alexandre, inspector of the markets, we shall see that there scarcely exist in all the stables of the Department of the Seine twelve cows affected with *pommelière**, and you should add, what is of capital importance, that the presence of tuberculosis in the cow is not enough to cause tuberculous milk, the udder must be tuberculous. These animals command a high market price, a good milch cow being worth six hundred francs (one hundred and twenty dollars), hence the owners have every interest in keeping only sound animals. Without, then, denying the possibility of transmission of tuberculosis by milk, we must consider it as extraordinarily rare. Moreover, there is a very simple way of avoiding infection,—namely, by boiling the milk, or by using the milk of the goat or the ass, animals rarely tuberculous.

But if there is a disease in which alimentary hygiene plays a preponderant *rôle* from the point of view of prophylaxis, this disease is surely typhoid fever.

Typhoid fever is one of the diseases which make the most havoc among our populations, and, to convince you of this, I need only refer you to the figures of Brouardel, presented a short time ago, and which show that every year typhoid fever carries off twenty thousand of our people. Such statistics are the more significant when we endeavor to estimate the prevalence of typhoid in the army, where it makes the greatest ravages.

From 1872 to 1884, the French army, which has numbered during these years five million three hundred and seventy-five thousand six hundred and nine soldiers, enlisted for a longer or shorter term of service, has lost by disease or by accident fifty-five thousand one hundred and eighty-nine, and one third of this whole mortality was produced by typhoid fever. There were, in fact, one hundred and fifty-one thousand three hundred and nineteen cases of this disease in the army, with a mortality of seventeen thousand six hundred and fifty-two. In view of such facts, you understand the interest which attends this great question of preservation from typhoid fever by a correct alimentary hygiene.

For a long time medical authorities have attributed to water contaminated by typhoid dejections a preponderant *rôle* in the development of this disease, and this before microbiological studies had made known the pr

* Alexandre, "Report to the Prefect of Police on Contagious Diseases of Animals observed in 188 Paris, 1889.

ence of the *bacillus typhosus* in the water and in the dejections. Here clinical observation had long gone ahead of bacteriological researches; but it must be admitted that the latter have given indisputable scientific confirmation to the doctrine of the communication of typhoid fever by drinking-water.

Leaving on one side all the works which have been called forth by the fæcal theories of typhoid fever, and the memorable discussions which arose between Murchison and Budd on this very subject in 1874 and 1875, and all that has been said as to the contagiousness of typhoid fever, I shall dwell only on the recent points which this question of contagion has raised.

It had long seemed demonstrated that the contamination of potable waters by the dejections of individuals affected with typhoid fever was one of the powerful causes of the contagion of this disease, and the reports on epidemics sent each year to the Academy of Medicine contained facts confirmative of this doctrine. I will mention particularly the reports of Lardier, of Rambervillers, which show us in the Vosges typhoid fever disappearing in certain cities when the population drank water from sources which had not been contaminated.

I will mention particularly the very precise observation of Dionis, of Carrières, pertaining to a fact which took place at Auxerre. A water-source from which a large part of the inhabitants of the city derived their supply became polluted by the dejections of a typhoid patient, and an extremely fatal epidemic broke out among those portions of the population which made use of this water.

I will also mention the city of Vienna, in Austria, where typhoid fever has almost disappeared since the inhabitants have abandoned all other kinds of water for drinking purposes but pure spring water. There are abundance of facts of this kind.

But it is to Chantemesse that we owe the experimental proof of the presence of Eberth's bacillus in contaminated waters. I need not remind you of the painful circumstances under which these researches were made. You all remember the instance of that family which was swept away by typhoid fever after making use of water from a well of Pierrefonds in which the fæcal matters of some typhoid patients had been emptied. On examining this water, Chantemesse found there the presence of the *bacillus typhosus*. Since then this question has been taken up from another point of view, and in a work undertaken by Grancher and Deschamps* these experimenters have endeavored to ascertain what becomes of the *bacillus typhosus* when the dejections of dothinenteric patients are thrown upon the soil. They have shown that the bacillus does not filter through the soil, and that it is arrested at forty to fifty centimetres of depth, and that there it may sojourn and develop so that five months afterwards it may still be found in the soil. Moreover, they have pointed out the fact that this bacillus never penetrates the pulp of sound vegetables.

I must also call your attention to the experiments undertaken by Straus and Dubarry to ascertain the vitality of the typhoid bacillus in water. They have shown that this bacillus was still living at the end of eighty-one days. In some previous experiments, Meade Bolton had noted their presence after three weeks. According to Wolffhugel and Riedel, the duration of the life of these microbes is twenty-eight days. The influence of purity of the water on the prolongation of the life of the *bacillus typhosus* is but little appreciable, and in distilled water, in the water of the Vanne, or in that of the canal of the Ourcq, Straus and Dubarry have seen these pathogenic microbes develop in a precisely similar manner. As for their virulence, it is absolutely intact, whatever may be the duration of the sojourn of these microbes in the water.

Must we admit, in accordance with Brouardel's opinion, that out of every hundred cases of typhoid fever, ninety have for their origin the usage of contaminated water? This is a point which merits discussion. While it is undeniable that the communication of typhoid fever is often effected by waters that have been polluted, it is probable that there are other factors which still escape us; in fact, we see typhoid fever appear and disappear in certain cities, and this without any real change being effected in the character or usage of their waters.

Take, for instance, the cities so numerous in France, where all or nearly all the dejections are discharged into the river which traverses them, and where the people of these cities drink only the water of this river. Typhoid fever appears there under the form of an epidemic more or less deadly, then ceases its ravages, and only a few isolated cases are now noted, and we cannot explain why at certain periods the epidemic has made so

* Grancher and Deschamps, "Researches on the Bacillus Typhosus in the Soil" (*Arch. de Méd. Exper.*, January 1, 1889).

many victims, and has been so benign at other seasons.

Even in cities where the inhabitants make use only of water that is absolutely pure, typhoid fever has not completely disappeared. At Vienna, which has often been cited in this connection, new cases were reported last year, so that we are obliged to confess that there are other factors which still escape us.

Wernich has maintained that meat undergoing putrefaction may cause typhoid fever, and he bases his opinion on the similarity which exists between the bacillus of putrefaction and the *bacillus typhosus*. I believe that this is a mistake. That altered meats, as we shall presently see, may give rise to toxic symptoms of typhoid form, is most certain, but they do not cause typhoid fever,—that is to say, that particular state characterized by the presence of the *bacillus typhosus*.

Nevertheless, of late this question of the possibility of the production of typhoid fever by the ingestion of the meat of diseased animals has been the subject of new researches. Writers have taken as the basis of their investigations the epidemics which prevailed at Kloten in 1878, at Bermenstorff in 1879, at Wurenlos in 1880, at Spreitenbach in 1881. At the autopsy of those dying from these epidemic diseases were found intestinal ulcerations, a voluminous spleen, and tumefied mesenteric glands. The animals that were the cause of these accidents were in most cases cows affected with puerperal diseases. Notwithstanding these results noted by careful observers, I persist in believing that these were cases of infectious gastro-enteritis with typhoid symptoms, and not true typhoid fever.

As a practical conclusion from what has gone before, it is evident that we ought to encourage all efforts to provide the inhabitants of our cities with pure drinking-water, and although this movement has slowly come about in France, it must be admitted that this question is now everywhere being agitated, and almost all our cities are making it a matter of obligation to give to the inhabitants potable water from sources that have not been polluted. When you are consulted on matters pertaining to the water-supply of towns, it will be your duty to require a most complete isolation of any fountain or water-source intended for the use of a given locality; it should be walled around and otherwise kept from the possibility of being polluted, and the infiltrations of the soil should not be allowed to penetrate it.

In any event, during epidemics you should recommend the use of boiled waters or of table-waters. In the regiments where there are percolators for making coffee, you can use these apparatuses, which, at very small expense and trouble, will give you boiled water.

For rich people, you will prescribe the table-waters, to-day so numerous, and which, in times of epidemics, render us great service. You will reject the artificial Seltzer waters, because the presence of the carbonic acid in no way opposes the life and growth of the micro-organisms which these waters may contain; and, in order that the latter may be fit for use, they should first be boiled before being charged with gas, or else filtered through a Chamberland filter.

This filter, in fact, in depriving water of its bacilli, is a guarantee against the propagation of typhoid fever, and you should recommend it in all cases where you suspect that the water may be contaminated. The Chamberland filter, as you are all aware, is a porcelain cylinder. In employing this filter, you cannot too much keep in mind the necessity of being certain that it is absolutely intact, containing no cracks; and, moreover, you should be careful frequently to cleanse and disinfect it by exposing it to a strong gas heat or to the heat of a furnace.

With the exception of this filter and all constructed on similar types, the other filtering apparatuses should be rejected, for, as has been rightly remarked, if these filters, which are more or less complicated, may rid the water of the noxious principles which it contains, they rapidly become foul, coated over with dirt, and are then a source of contamination to the water, however pure, which passes through them; they are then more dangerous than useful.

It has been objected to the Chamberland filter that it demands a high pressure, which is rarely obtained. But it is quite possible at the present day, by employing a number of them grouped together, like the cells of a battery, to obtain, with very little pressure, enough potable water for the daily consumption.

The use of table-waters, boiled water, water filtered by apparatuses which deprive it of micro-organisms, such are the means to be put in operation to remove one of the most active causes of the propagation of typhoid fever.

But thus far in this question of prophylactic hygiene I have taken up only the subject of the possible propagation, by water or food, of microbe diseases. There are other affections of a parasiticism much more elevated, which depend for their transmission on food and drinking-water. I refer to the helminthic diseases, and, in particular, to those associated with the names tæniæ, hydatid cysts, and trichinæ.

I need not take up your time with the natural history of tæniæ and hydatids, which I have treated at considerable length in my "Diseases of the Stomach and Intestines."* I will only remind you that with respect to the tænia, it is by the consumption of measly pork or beef containing the cysticercus of the unarmed tænia that the propagation is effected. Hence it is that in our markets the sale of this meat is interdicted under a heavy penalty. This, however, does not prevent the tapeworm disease from being very common, for the following reasons: If it is easy to recognize measly pork, it is much less easy to detect the kindred cysticercus disease in cattle; and, moreover, the use of raw meat in therapeutics has become very general, and has, doubtless, had much to do with the spread of the tapeworm malady, for cooking is a prophylactic means, which, in destroying the cysticercus, destroys the contagious principle.

With reference to this particular point of the effect on meats of culinary heat, Decroix has defended the proposition that thorough cooking makes it safe for us to eat the flesh of animals affected with all the diseases reputed to be infectious and contagious; and at the Congress of Hygiene, held in Paris during the Exposition of 1878, he affirmed, by experiments made on himself, that there was no risk in eating the meat of animals which had succumbed to glanders, anthrax, cancer, etc., provided that this meat had been well cooked.

I believe that this position is untenable, and cannot be too strongly condemned. It is a very difficult matter to say when the cooking of our foods is done in an absolutely thorough manner, and as it has been proved that charbon may be developed by intestinal absorption, we cannot institute too rigorous measures to prevent animals affected with this disease from being sold in our shambles and markets.

Cooking has a still more important *rôle* in the prevention of the transmission of trichina. While trichinosis has been observed in isolated sections of North America, and in Germany where there have been a great many epidemics, an instance of which is that of Emersleben, where forty-six persons succumbed (as recorded by Brouardel and Grancher), cases of this disease in France have been extremely rare. We may say that the disease is practically unknown among us, and the only instance which we can cite is that observed by Jolivet at Crépy-en-Valois, of which Laboulbène has given us the account. This marked difference is due to the fact that, while in Germany the inhabitants eat a great deal of raw pork, and, in particular, raw sausages, in France we always subject these meats to a certain degree of cooking.

If meat is the chief factor in the transmission of tæniæ and trichinæ, hydatid cysts are communicated by drinking-water. The tænia echinococcus has its ordinary habitat in the intestine of the dog, and its ova are expelled with the excrements of the latter. When the storm-water after heavy rains washes out the roads, these eggs are carried along into some near brook or other water-source, and those that drink the water imbibe the germs of the hydatid cyst, which, after having traversed the digestive tube, are generally arrested in the liver, although they may clear this barrier and penetrate to all parts of the economy.

You should always have in mind this possibility of the transmission of a grave disease by the water of brooks or springs, and never drink such water without filtering it. Here the charcoal filter answers every purpose, and you will find for sale in the shops little pocket filters, which are extremely handy and useful. I pass now to the last part of my subject,—namely, to poisoning caused by putrefied meats.

When I spoke to you of the ptomaïnes and leucomaïnes, I told you that at the very moment of death ptomaïnes are produced, and that certain of them possess a very great toxic power. You will not, then, be surprised to learn that the ingestion of altered meats is capable of determining morbid accidents of the greatest gravity, and even death.

Writers have especially called attention to cases of poisoning brought about by the use of meats, canned or otherwise preserved, codfish, sausages, meat-pie made from the hare (*paté de lièvre*), hog's-head cheese, etc., and I must refer you for facts of this kind to the contributions of Robert, Durier, Camus,

* "Diseases of the Stomach and Intestines." Wm. Wood & Co., New York, 1886 (Library Series for

Schaumont, Beringer-Feraud, Baillon, Brouardel, and Schmit.*

All these toxic manifestations appear from five to twenty-four hours after the ingestion of altered meats, and two periods may then be distinguished, the one of poisoning, the other of elimination. The first is characterized chiefly by anxiety, shivering, and then severe chills, headache, with vertigo and dazzling sensations; the second, by vomiting, a profuse diarrhœa, etc.; lastly, by the presence of albumen in great quantity in the urine. To these symptoms are joined a profound algidity, a tendency to somnolence, and a complete prostration of the forces.

This symptomatic aggregate is very similar to that which is determined by poisoning by mushrooms, and particularly the false orange-agaric, and this is easily understood, as the action of certain ptomaïnes is quite similar to that of muscarine.

As might have been inferred, cooking plays here a very important *rôle*, and always the symptoms of poisoning are the more intense the more imperfect has been the cooking. These ptomaïnes are so toxic that it requires but a very small quantity of putrefied meat to produce symptoms of the greatest gravity.

These facts show how rigorously municipal governments should enforce the proscription of all decomposing meats, and in particular of game and fish, and the earnest measures which should be taken for inspection of whatever is sold in the shambles and markets. Fish, as I have told you, undergoes a very rapid alteration, and ptomaïnes and amines of great toxicity are formed.

This same inspection should be exercised with regard to mollusks and crustaceans. Poisoning by muscles (*Mytilus edulis*) is very frequent, and has its source in the formation of *mytilotoxine;* that by oysters is not less frequent; and my laboratory chief, Bardet, has given an account of an instance of the kind where he was the sufferer.

These accidents are the more intense the more the channels of elimination are obstructed, and particularly the renal emunctory, and from this point of view of renal insufficiency this question of ptomaïnes and leucomaïnes presents a great interest.

It is recognized to-day that the symptoms formerly referred to uræmia or stercoræmia result from the retention of leucomaïnes or ptomaïnes in the economy, and that the treatment to be opposed to the development of these accidents is based entirely on dietetics, and on the employment of purgatives and diuretics.

The *rôle* of alimentary hygiene consists in introducing into the economy the least possible quantity of ptomaïnes, and here the vegetarian regimen admirably meets the indication.

I have often laid down the principles of this regimen, which gives me in all cases of renal insufficiency such good results, and you will allow me to reproduce here the main features of this dietary system:

You will require of the patient that he shall live exclusively on eggs, starches, green vegetables, and fruits.

The eggs shall be thoroughly cooked (omelets, scrambled eggs, custards).

The starchy substances shall be in a state of stew or pulp (*i.e.*, thoroughly cooked), such as potato soup, soup with red or white beans, peas, or lentils, *revalescière* (a mixture of several farinas), milk porridge, racahout, flour puddings, or puddings of rice, Indian meal, barley and oatmeal, strained panada, dumplings, "noodles," macaroni.

The green vegetables shall be well cooked (stews or soups containing carrots or turnips, Julienne soup, cooked salad, and spinach).

Fruits shall be stewed, instead of being eaten raw.

If fresh roast pork and bacon may be authorized in such a diet-table, it is because the prolonged cooking of the first and the salting and smoking of the second are an obstacle to the development of ptomaïnes.

You will absolutely forbid the use of fish and of game.

It is always in conformity to the same principles that we should direct the treatment of dilatation of the stomach. The prolonged sojourn of aliments in the gastric cavity favors the occurrence of fermentations there and in this way the production of ptomaïnes, and you should combat both by diet and all the means of intestinal antisepsis the evils which result from these vicious fermentations. I have not time here to take up this great question of intestinal antisepsis, which I have treated

* "Contribution à l'Étude des Ptomaïnes" (*Annales d'Hygiene*, 1880); Durier, "Note sur dix cas d'Empoisonnement par les Conserves de Bœuf" (*Archives de Médecine Militaire*, 1884); Camus, "Note sur l'Alteration des Conserves par les Ptomaïnes" (*Archives de Médecine Militaire*, 1886); Schaumont, "Relation d'un Empoisonnement par la Morue" (*Archives de Médecine Militaire*, 1878); Beringer-Ferand, "Recherches sur les Accidents que Provoque la Morue Altérée," Paris, 1885; Baillon, Pharmacien Major, "Des Ptomaïnes" (*Archives de Médecine Militaire*, 1885).

where in my "New Medications,"* and which is discussed in a masterly manner in the recent work of Professor Bouchard.†

Such, gentlemen, are the considerations which I desired to present relative to this question of "Prophylactic Hygiene." You will find, moreover, in my lectures on "Alimentary Hygiene"‡ the complement of the indications which I have here furnished, and it remains for me, in completing this course of lectures, to speak of legislation in its relation to prophylaxis, and this will be the subject of my next lecture.

SPINAL LOCALIZATION IN ITS PRACTICAL RELATIONS.§

By Charles K. Mills, M.D.‖

PART II.—THE FACTS AND RULES OF SPINAL LOCALIZATION.

IN a paper on "Cerebral Localization,"¶ I directed attention to the possibility of six classes of symptoms presenting themselves for the consideration of the neurological diagnostician,—namely, those of (1) local irritation, (2) local destruction, (3) local pressure, (4) invasion by lesions growing from adjacent areas to those under determination, (5) local instability, (6) reflex action at a distance. All or any one of these classes might require to be considered in localizing a spinal lesion, but the last three are not relatively of as much importance in spinal as in encephalic diagnosis; and, in order to restrict the present paper to reasonable limits, the discussion of this part of the subject will practically include only a study of symptoms of irritation, destruction, and pressure. Irritative, destructive, and compression lesions, whether intracranial or intraspinal, give rise mainly to three great classes of diagnostic phenomena,—reflex, sensory, and motor. Vaso-motor, trophic, visceral, thermic, psychic, and some special symptoms, have at times considerable importance, but are generally secondary in value for ordinary practical purposes to the three classes mentioned.

Under reflex phenomena are usually included the cutaneous reflexes,—scapular, epigastric, abdominal, cremasteric, gluteal, plantar, etc.; and the so-called tendon reflexes,—wrist-jerk, knee-jerk, ankle-jerk, ankle-clonus, perineal jerk, etc. Under the same head also come such phenomena as the involuntary reactions of the rectum, bladder, and sexual organs. Reflex symptoms may be, as might be expected from the functions of the spinal cord, of decided localizing value in spinal lesions, whereas for brain lesions they are usually only of general significance and value. Such reflexes as the scapular, epigastric, abdominal, cremasteric, gluteal, plantar, and rectal may, for instance, greatly help to fix the height of a lesion, as may also such phenomena as knee-jerk, muscle-jerk, and ankle-clonus, but the latter are sometimes in spinal as in cerebral cases only of general significance.

Some of the so-called reflexes are a guide to definite spinal segments. While, however, it is important and a great aid to prompt diagnosis to recognize quickly certain marked isolated symptoms, as disturbance of particular reflexes, on the other hand it is essential that such phenomena should not be misinterpreted. Exaggeration of certain reflexes, as, for instance, the ankle-jerk, knee-jerk, the cremasteric jerk, etc., indicates not merely disease producing irritability of the centres for these phenomena, but, it may be, rather disease or compression in the cerebro-spinal axis anywhere above these centres. Abolished knee-jerk may be indicative of extensive degenerative disease of the spinal cord, as in posterior sclerosis; or, it may, in much rarer cases, indicate limited disease of the particular segment of the cord related to the patellar tendon. Westphal,** for instance, has reported the autopsy of a case of dementia paralytica, in which the patellar reflex had been absent on the left side only; and in which sections of the cord showed extensive sclerosis of the posterior root zones at the junction of the lumbar and dorsal regions on the left side, while on the right was only a slight beginning of the sclerotic process.

Under sensory phenomena it is necessary to consider clearly the particular variety of sensation lost or perverted, the exact cutaneous areas affected by increase, depression, or perversion of sensation, the nerves in-

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* "New Medications," Detroit, Library Series, 1886, chap. v. p. 99.

† Bouchard, "Thérapeutique des Maladies Infectieuses." Paris, 1889.

‡ Dujardin-Beaumetz, "Hygiène Alimentaire." Paris, 1889.

§ Read before the College of Physicians of Philadelphia, March 3, 1889.

‖ Professor of Diseases of the Mind and Nervous System in the Philadelphia Polyclinic, etc.

¶ "Transactions of the Congress of American Physicians and Surgeons, First Triennial Session, Washington, 1888.

** "Ann. Univ. Med. Sci.," vol. i. p. 95, 1888.

volved, the situation of their nuclei in the cord, and the relations of their origin to the intervertebral foramina. These sensory phenomena include the symptoms,—pain, hyperæsthesia, anæsthesia, and paræsthesia.

The great motor symptoms are paresis or paralysis, spasm, contracture, and tremor. In studying motor phenomena, we must consider not only the muscles affected by loss or exaltation of power, the exact nerve-supply to such muscles, and the intraspinal course of these nerves, but also the situation of the nuclei of these nerves in certain segments of the spinal cord, and even the particular cell-groups to which such nuclei belong. The value of a study in spinal localization depends largely upon the *exactness* with which we differentiate such phenomena and relate them to their lesions.

A good practical point is the importance of some single striking fact in spinal function in localization diagnosis for surgical or other purposes. That the phrenic or diaphragmatic spinal centre is situated in the fourth, or in the third and fourth cervical segments, should, for instance, be taken into full consideration in operations in this locality, great care being taken not to bruise or deeply injure the cord, or to explore with needles or by incision a region where such a vital centre has its abiding-place. Respiratory and cardiac phenomena occur with lesions at and above the phrenic centre; pupillary changes when the cord is affected above the level of the second dorsal nerve or segment; while extreme trophic or vaso-motor affections of the skin and its appendages are only present when the central gray matter, somewhat posterior to the central canal, is diseased.

My main object in this portion of the present paper is to give the methods of referring or relating sensory, motor, reflex, and other phenomena, which are distributed in limited regions of the body to the particular levels of the spinal cord in which they have their source or termination. It is necessary, for both the physician and surgeon, to have quick and ready methods of determining the position of a lesion in the spinal cord by a study of the symptoms presented. The study is a broad one, and, in considering it, a paper might be almost indefinitely extended; it is necessary, therefore, to seize upon salient features and methods of presentation.

SOME POINTS IN COARSE SPINAL ANATOMY.

Certain well-known anatomical facts should always be borne in mind when considering for practical purposes the question of spinal localization. We should remember that the spinal cord proper is only from seventeen to eighteen inches long, while the spinal canal to the last lumbar vertebra is about twenty-three inches, and, if the sacral portion and coccyx are included, four inches more should be added. The cord, therefore, is much shorter than the canal, and usually reaches only to about the second lumbar vertebra. As already indicated in Part I., one of the most important and most available positions for successful spinal surgery, in cases of localized lesion, is the region of the cauda equina, most of which is entirely below the spinal cord. We have, in other words, a comparatively extensive intraspinal region, in which the lesions are, strictly speaking, peripheral, and the diagnosis, both local and general, must be made with this fact fully recognized. That the spinal cord does not fill its canal transversely is also a familiar fact, the significance of which should also always be before us. The cord is, indeed, suspended very loosely in the canal. It follows, therefore, that many of the intraspinal lesions which are operable are membranous or bony in origin, and in symptomatology are, in part, at least, peripheral, as they involve nerve-trunks in their intraspinal course, however long or short this may be. Every one who wishes to become practically familiar with spinal anatomy for surgical purposes should study a series of transverse sections showing the relations of the spinal cord to its enclosing envelopes, membranous and bony. Even the dural sheath is much larger than is necessary for its contents. I have already referréd to the fact growing out of such anatomical studies of the spine, that the spinal cord can be lifted with care so as to be the subject of operation on any of its surfaces, anterior or lateral, as well as posterior. A consideration of all the questions relating to the spinal membranes and spaces will eventually enable us to separate with fair accuracy the lesions which are supradural, subdural, and strictly speaking spinal.

For various reasons, operations for localized lesions, next to the cauda equinal region, probably offer more chances of success in the dorsal spine than elsewhere, owing to the less size of the cord and the less danger in operating. In the cervical and lumbar enlargements the greater bulk of the cord and the closeness of the nerve-roots is always to be considered. From one part of the cord, the smallest in transverse section, some of the largest nerves of the body originate. This

the narrowed lowest extremity of the cord, the conus medullaris, in which the lower sacral nerves have their roots. It is a region small in general bulk, because, owing to its position, it contains few conducting tracts, although relatively a large amount of gray matter. Lesions of this conus medullaris, embedded in its net-work of great nerves, can be accurately made out by symptoms, and its actual and relative size to the membranes and spaces of the spine should therefore always be kept in view.

The intraspinal course of the spinal nerves should be absolutely familiar. Nearly all of the nerve-roots descend to the foramina, from which they emerge to be distributed to various parts of the body. The lowest nerves have, of course, the longest intramural course. Some facts about the relations of spinal segments to the vertebræ, foramina, and nerves are, doubtless, known to all, but are probably not much considered. The segmental nature of the spinal cord will be referred to presently at some length. The term spinal segment is used to indicate the limited vertical portion of the cord from which arises each pair of spinal nerves. In the cervical region are eight of these segments, but only seven vertebræ; hence the eight pair of spinal nerves emerge from their foramina in such a manner that, although they all descend a little in their course, they emerge after the first, so that the segments, are located opposite spines and bodies of the vertebræ, which do not correspond in name. The third cervical segment, for example, according to Gowers, is about opposite the first cervical spine, and its nerves emerge between the second and third cervical bodies. The eighth cervical segment is about opposite the sixth cervical spine, or the junction of the sixth and seventh, and its nerves emerge between the seventh cervical and first dorsal body. In the dorsal region the segments are the longest of the entire cord, and they are not situated numerically opposite the spines and bodies of the same name in any single case. The first dorsal segment is nearly opposite the seventh cervical spine and body; the second dorsal nearly in a line with the first dorsal spine and body. The tenth, eleventh, and twelfth dorsal segments are much shorter than the segments from the first to the ninth, and these three segments are included chiefly between the eighth and tenth dorsal spines and bodies. The entire eleven spinal segments, from the first lumbar to the coccygeal, inclusive, are crowded vertically between the eleventh dorsal and second lumbar spines and bodies, a space of only about two to three inches.

Commonly, we speak only of two sets of nerve-roots,—the anterior or motor, and the posterior or sensory,—the great discovery of Sir Charles Bell. Bell, however, really divided the nerve-roots throughout the central nervous system into three sets, the third being a lateral or respiratory set, and containing nerves which excite motions which depend on or are related to the act of respiration. Gaskell* says that physiologists have failed to follow this because the triple arrangement of these nerve-roots was not immediately evident, like the separation of the anterior and posterior roots. This lateral tract of nerve-roots is the same as the non-ganglionated part of the splanchnic root.

These lateral roots do not concern us much with our present lights in determining questions of localization. When, however, visceral and vascular localization have been more perfected, the question of the existence and involvement of these lateral groups will receive greater attention. Every segment of the spinal cord, according to Gaskell, gives origin to two roots, a somatic and a splanchnic,—the latter being the roots of the nerves supplied to the viscera and blood-vessels; the former to the muscles, skin, and tissues other than those which are vascular and visceral. The somatic roots are, in other words, the motor and sensory, or the anterior and posterior roots, and in the main are connected respectively with the cells of the anterior and posterior cornua. The lateral roots arise from two columns of nerve-cells,—namely, the column of Clarke and a column in the lateral horn. The splanchnic root arising from the column of Clarke is ganglionated, while that arising from the lateral horn is non-ganglionated; and the nerves corresponding to the latter go to muscular tissues chiefly. Lesions of these nerve-roots, or of the cell-groups or columns of the cord, with which they are connected, give rise chiefly to vaso-motor, trophic, secretory, and visceral phenomena, distributed in accordance with the segment of the cord or the special pair of nerve-roots implicated. These lateral roots are found in greatest number in the region from the second thoracic or dorsal segment to the first lumbar.

SEGMENTAL CHARACTER OF THE SPINAL CORD.

One of the first steps towards an understanding of spinal localization is the full rec-

* *Jour. Physiol.*, vii. 1–80. London, 1886.

ognition of the segmental character of the spinal cord. It is to be regarded not as a single organ, but as a series or succession of organs vertically linked together,—a chain of segments one placed above another. In many of the lower animals, as in fishes and snakes, this arrangement is obvious, the spinal cord being made up of a series of alternating swellings and constrictions. "Each segment," says Bramwell,* "may be viewed as a distinct spinal unit, or, to speak somewhat figuratively, as a distinct spinal cord for a definite area of the body,—viz., that portion of muscle (muscular area) to which its anterior roots proceed, and that portion of skin, tendon, muscle, mucous membrane, viscus, etc. (sensitive area), to which the fibres of its posterior nerve-roots are distributed. Now, the essence of the clinical examination of the spinal cord consists in the separate and systematic examination of each spinal segment by observing the motor, sensory, reflex, vasomotor, and trophic conditions of the body area." According to Professor Hill,† of Cambridge, the recognition of the segmental succession in the arrangement of the nuclei of the nerves of the spinal cord is due to the late Professor Aeby. In the Hunterian Lectures, in 1885, Hill applied this principle of segmentation to the brain, or, at least, to the cranial nerves, attempting to fix the position in the cerebral axis of the nuclei of these nerves by a consideration of their segmental distribution in the head.

LOCALIZING PHENOMENA REFERABLE TO THE CONDUCTING TRACTS IN THE SPINAL CORD.

The spinal cord of man, besides being a great centre, or collection of centres, includes also a conducting medium, through which the great tracts (motor, sensory, etc.) pass, to connect the brain with all the segments situated below, and these segments with each other. In man, the conducting tracts may be regarded as developmental additions to the original spinal segment. It is in its capacity as a centre—in the capacity of each segment as a special centre—that we are particularly concerned in studying spinal localization, but the symptoms produced by irritation, destruction, or compression of the conducting tracts will often greatly modify an opinion as to the exact height, and particularly the extent of a lesion. I cannot, of course, go into a lengthy consideration of the functions of the white substance of the cord. This can be found in the treatise of Gowers or any good work on nervous diseases. For completeness, however, I will summarize the subdivisions of the cord and their functions, and make some practical applications to the subject of localization, in the main following Gowers in giving the functions of the different subdivisions. A transverse section of the cord at different heights would give a somewhat but not greatly differing appearance. In a portion of the cervical region the greatest number of subdivisions are present. Starting here with the posterior median portion of the cord,—the part which would be first exposed by the surgeon's knife and saw,—the posterior column is divided into two parts,—the *column of Goll*, or *postero-median column*, and the *column of Burdach*, also known as the *postero-external column*, or *posterior root zone*. The column of Goll in all probability conducts tactile impressions. The column of Burdach, containing, as it does, the posterior root fibres, has for its function the conveyance of sensory impressions inward through these root-fibres, and probably also for short distances it carries these sensory impressions vertically. Just external to the periphery of the posterior horn begins a most important conducting tract,—*the pyramidal tract*, or, as it is usually called, *the lateral or crossed pyramidal tract*,—which occupies the posterior half of the lateral column outside of the posterior horn. Its function is unquestionably chiefly motor conduction, particularly from the brain to the parts below the arm. A column, shallow from without inward, but wide circumferentially, is the *direct cerebellar tract*, which lies chiefly between the lateral pyramidal tract and the periphery of the cord. Flechsig believes that this column conducts impressions from the muscles of the trunk. When diseased it degenerates upward, and therefore its function must be to conduct upward. It is probably connected with Clarke's vesicular column and therefore with visceral and vascular sensibility and control. Between the pyramidal tract and the concavity formed by the junction externally of the anterior and posterior horns is a comparatively narrow space called *the lateral limiting layer*, whose fibres may connect the gray matter at the different levels. What Gowers has termed the *antero-lateral ascending tract* occupies about the same position in the antero-lateral columns as the direct cerebellar tract does in the postero-late-

* "Diseases of the Spinal Cord," p. 1. Edinburgh, 1884.

† *Brain*, January, 1888.

column. Its function is believed by Gowers to be the conduction of the sensations of pain and temperature. In disease it certainly degenerates upward, and therefore must in health conduct upward. Journeying still towards the front of the cord and the median line, we find that the antero-lateral white substance is very largely occupied by what is now called the *column of the anterior ground-fibres*, a name given by Flechsig. The anterior root-fibres traverse it, and its function is probably also to connect the anterior horns at different levels, and through the anterior commissure the anterior horns of the two sides of the cord at the same or at different levels. Like the posterior root zone, the ground-fibres of this column do not degenerate through any considerable vertical length of the cord. Lastly, the *anterior pyramidal tract, or column of Türck*, is a narrow tract lying close to the anterior median fissure, sometimes varying in form and size, and having for its function the conduction of motor impressions from the brain to the arm. If this is its function its fibres must cross in the cord.

It is evident from this brief statement of the subdivisions of the white substance of the cord that, by closely bearing them in mind, the diagnostician will be greatly helped in locating the horizontal as well as the vertical position of a focal lesion, compressive or destructive, or both. Such a consideration may enable us to say, for instance, whether such a lesion is anterior, posterior, or lateral, or how much it occupies any one or more of these positions; or, finally, a matter of great importance, as pointed out by Horsley, the mode of extension of a unilateral lesion, by a tumor which eventually becomes bilateral.

One of the oldest, and, at the same time, one of the best, illustrations of the importance of bearing in mind the functions of the various columns or tracts of the cord is afforded by the affections known as spinal hemiplegia and spinal hemi-paraplegia, which are due to focal lesions confined to a lateral half of the spinal cord. In the first place, such a lateral lesion is modified by its height in the cord. If comparatively high up in the cervical region and completely unilateral, the patient would exhibit motor paralysis of both the arm and the leg on the side of the body corresponding to the seat of the lesion, because of the implication of the column of Türck or direct cerebral tract, and the lateral or crossed pyramidal tract, which both decussate above the lesion. Sensation would be affected chiefly on the side of the body opposite to the seat of the lesion, because of the involvement of the antero-lateral ascending tract and the column of Goll, and because also the sensory tracts decussate in the cord itself. From involvement of the direct cerebellar column, vaso-motor and visceral symptoms would be present, chiefly on the same side as the lesion. The temperature is sometimes higher, for instance, on this side. The pupil may be affected through the cilio-spinal centres. This is simply the gross, sketchy picture of a lesion high up in the cord. The phenomena would vary considerably according as the lesion was chiefly compressive, irritative, or destructive.

A unilateral focal lesion of the dorsal cord would give hemi-paraplegia. In such a case the arm, the pupil, and the neck escape. Motor paralysis occurs in the leg of the same side, and anæsthesia in the trunk and leg of the opposite side. Sometimes a band of hyperæsthesia, or even wide-spread hyperæsthesia, is present on the side of the lesion, due doubtless usually to irritation of nerve-roots.

Instead of this somewhat complete symptom-picture, we may have a set of symptoms which are dependent upon involvement of only one or two of the subdivisions of the white substance of the cord, although such exceedingly circumscribed lesions are comparatively rare. By the close study of history and symptoms we can sometimes trace the progress of a lesion from one tract to another.

Some peculiarities in sensory symptoms may occasionally give the clue to the possible extent of a lesion. The loss of the tactile sense, with the preservation of the senses of pain and temperature, for example, mentioned in one of the cases in the first part of this paper, was possibly of some value in connection with the question of the localization of the spinal paths for the transmission of the sensations of touch, pain, and temperature. Schiff's and Gowers's view, as stated, is that the lateral columns contain the tracts for sensibility to pain and probably also to temperature, and the posterior columns the paths for the conduction of tactile sensibility. In a case of focal lesion with compression, like the one reported, the existence of tactile anæsthesia, without loss of sensation of pain and temperature, would seem to be most easily explained on the supposition that the paths for these different sensations are not in exactly the same position in the cord. The columns for touch being

the most posterior, the tactile anæsthesia may have been due to counter-pressure from jamming backward of the cord by the vertebral displacement.

Let me say a few words about the vertical extension of the spinal conducting tracts. The column of Goll, or postero-median column, extends throughout the whole length of the cord. The postero-external column, or column of Burdach, posterior root zone of Charcot, continues throughout the entire cord, but degenerates only a short distance above a lesion. The direct cerebellar tract only reaches from the level of the first lumbar nerve upward, chiefly from the region of the vesicular column of Clarke; it does not, for example, degenerate from a lesion of the lumbar enlargement. The lateral limiting layer, between the lateral pyramidal tract and posterior horn, is throughout the cord. The fibres of the antero-lateral ascending tract of Gowers, often confounded with the cerebellar tract, pass upward through the whole length of the cord. The anterior ground-fibres also extend throughout the whole length of the cord. The column of Türck is present only in the cervical and upper dorsal cord. The lateral pyramidal tract extends through the whole length of the cord.

The importance of knowing the vertical extension as well as the position of the spinal columns for practical purposes is at once evident, and in diagnosis comes out with great distinctness in localizing focal lesions of very limited extent. Such a lesion might, for example, involve only or chiefly the columns of Türck, or anterior pyramidal tract, and would, therefore, give us motor-conducting symptoms, largely confined to the arms. If the lesion was lateral or peripheral, it might only or chiefly involve the ascending antero-lateral tracts, and give us for symptoms interference, with sensibility to pain and temperature, on one or both sides. The same reasoning can be readily extended to other isolated or neighboring tracts.

In considering a lesion below the upper dorsal region the practical diagnostician would not take into account the column of Türck, which has no existence below this level. The direct cerebellar column would also be out of consideration in large measure in lesions of the lumbo-sacral cord and cauda equina. On the other hand, the columns of Goll and of Burdach, the crossed pyramidal tract, the antero-lateral ascending tract, and the region of the anterior ground-fibres would be considered at any and all heights.

SEGMENTAL LOCALIZATION.

Theoretically, it is possible to localize a lesion in any segment of the cord. It is practically possible to do this in many segments of the cord, and for some the process with our present light is by no means difficult. For any vertical subdivision of the cord containing two or three segments we should be able to localize lesions with sufficient accuracy for grave operations.

In the detailed study of segmental localization, the order in which the subject will be considered is (1) sensory localization; (2) motor localization; (3) reflex localization; (4) the localization of vaso-motor and trophic phenomena. Regarding the cord as made up of a series of reflex systems, or reflex nerve-roots or arcs, as they are commonly called, sensory impressions are conveyed inward from the peripheral end organs to sensory roots and centres; thence are transferred to motor centres, and thence outward again reflexly to roots, nerves, and muscles themselves; so that the study of a single segment of the cord will include sensory, motor, and reflex phenomena. When the brain takes part the sensory impression enters the cord by the posterior nerve-roots, and, if not reflected at once, passes up the opposite side of the cord to the cerebrum, and eventually calls forth a motor impulse, which is sent down the cord to the anterior motor cells, and thence to the muscles.

SEGMENTAL SENSORY LOCALIZATION.

The sensory mechanism of the cerebro-spinal system consists, then, of peripheral end organs which receive impressions, incoming nerve-fibres which carry them by way of the posterior roots into the spinal cord, commissural fibres which immediately or almost immediately transfer them to the opposite half of the cord, and ascending conducting tracts by which they are conveyed up the cord to the oblongata, pons, crus, internal capsule, corona radiata, and brain cortex. Various interrupting ganglia are interposed along this sensory highway; but these we shall not here consider. Dividing one-half of the spinal cord will cause anæsthesia in the opposite half of the body below the place of hemi-section, and at the same time a line or belt of hyperæsthesia or anæsthesia may be produced on the same side as the lesion in the distribution of some particular nerve-root or roots injured. This has already been referred to in considering spinal hemiplegia and hemi-paraplegia. This anæsthesia is in the ma caused by severance of the ascending

ducting paths for sensation, which are in the side of the cord opposite to the parts of the body supplied. It is necessary, however, to consider more particularly the sensory effects in certain territories and their special subdivisions, because of the implication of one or more segments, or limited vertical extensions, of the spinal cord.

Segmental sensory localization has not been much elucidated by the contributions of physiologists, who have done so much for motor localization. The contributions to segmental sensory localization are, indeed, few and of quite recent date. The most valuable, some of them already referred to in a general way, have been furnished by Ross* and Thorburn;† and by Herringham,‡ Paterson,§ and Goodsir,‖ who are quoted by Ross. The limits of this paper will allow me only to refer briefly to this subject, chiefly giving the facts determined by Ross and Thorburn. Heiberg's¶ "Atlas" was of value in my studies of the various sensory areas of the skin. The papers from which the most useful data have been obtained have been clinico-pathological and embryological,—studies of cases of injury to the spinal cord, intraspinal nerve-trunks, and extraspinal nerve-trunks and plexuses; and investigations chiefly developmental and morphological of the limb plexuses of the lower animals and of man.

A spinal nerve, as Ross shows, is derived from the cord by a posterior (superior) gangliated and an anterior (inferior) non-ganglionated root. Where the two roots come together the nerve divides into a superior primary division supplying the skin of the back over the neural canal; and an inferior primary division, which subdivides into a dorsal trunk, supplying the lateral, and a ventral supplying the ventral or anterior surfaces. A branch is also given off the viscera.

The entire surface of the body may be divided into three great nerve territories,—one posterior, one lateral, and one anterior or ventral.

The sensory nerve-supply to the posterior territory is comparatively easy to understand. It is from the superior primary divisions of the spinal nerves. It occupies a region which may be roughly described as consisting of the back of the head and the back,—the region over the neural canal. Heiberg says that its lower limit may be taken to be roughly indicated by the crest of the ilium inside of the sacrum. The back of the head is supplied from the upper cervical nerves, because in the process of evolution the skin of the back of the neck has been dragged upward in order to cover the greatly-enlarged brain and skull of the man. This posterior nerve territory in the head reaches forward over the top of the head and forehead to the root of the nose, its anterior portion being supplied from the superior primary or first division of the trigeminal or fifth nerve. Ross compares the distribution of the sensory nerves in the dorsal or posterior region of the cord with that which is seen in the lowest vertebratæ,—the amphioxus, for example. In the amphioxus section of the posterior roots of a pair of nerves will cause anæsthesia of exactly corresponding sections of the body. In man section of the dorsal posterior roots, superior primary division, likewise produces anæsthesia of the skin of corresponding segments of the body, the only differences being that in man some anastomoses of different dorsal nerves occur, and the nerve areas of distribution tend to be placed successively lower with reference to the levels at which the nerves originate.

The anterior nerve territory of the trunk in a manner corresponds to the posterior territory,—that is, it occupies a position on the front of the trunk and face comparable in extent to that of the posterior territory on the back and head. The anterior and lateral cutaneous nerves of the thorax are branches from the same nerves. The lateral territory is the largest and in many respects the most important sensory surface. Heiberg says that the line of demarcation between the lateral and anterior territories generally divides the breast into two equal halves, the distribution of the anterior branches, however, extending on to the front of the thighs. The extremities are largely supplied by the lateral branches. In the neck the branches are all anterior and posterior; in the thorax the anterior and lateral cutaneous branches are from the same nerves.

The limb plexuses are formed from the union of the branches of the inferior primary

* *Brain*, April, 1884; ibid., January, 1885; ibid., January, 1888.

† *Brain*, January, 1887; ibid., January, 1888; ibid., October, 1888; *Brit. Med. Jour.*, December 22, 1888; and *Med. Chron.*, April, 1889.

‡ *Proc. Roy. Soc.*, vol. xli., 1887.

§ *Jour. Anat. and Phys.*, April, 1887; ibid., July, 1887; and *Quart. Jour. Micr. Sci.*, vol. xxviii., 1887.

‖ *Edin. New Phil. Jour.*, N. S., vol. v., January, 1857, and *Anat. Mem.*, vol. ii. Quoted from Paterson by Ross.

¶ "Atlas of the Cutaneous Nerve-Supply of the Human Body." By Jacob Heiberg, M.D. Illustrated by Alfred Fosterud. Translated and edited by W. W. Keen, B.A., F.R.C.S.

divisions of the nerves. The sensory nerves from the two branches of this inferior primary division are very irregularly distributed in the limbs,—that is, looking at the matter from a gross topographical point of view. This is due to the fact that, in the process of development of the limbs in the evolution of higher from lower animal forms, the sensory nerves, both dorsal and ventral, have been irregularly arrested in the extremities. In the formation of the plexuses the dorsal branches nearly always unite with the dorsal, and the ventral with the ventral branches only; although Paterson, according to Ross, admits exceptions in the case of the small sciatic nerve, which is formed by a union of dorsal and ventral fibres, and in that of the external and short saphenous nerves which are undoubtedly so constituted.

In the limbs, then, the sensory disturbances which are due to involvement either of the cervical or lumbo-sacral segments of the spinal cord, or of the nerve-roots or nerves springing from these segments, are distributed more or less longitudinally in accordance with the particular segment or nerve affected. The hyperæsthesia, for example, which in a dorsal lesion extends around the trunk in the form of a belt or girdle, in a cervical or lumbo-sacral lesion has a longitudinal distribution more or less regular in the limbs. In like manner, the anæsthesia and paræsthesia present in the limbs have distributions in accordance with the shape of the cutaneous sensory areas. A knowledge of sensory segmental localization is therefore necessary that the diagnostician shall quickly be able to decide on the spinal or other localization of a lesion by the zone of disturbance in the limb.

Sensory segmental localization follows certain laws. If the upper extremity, according to Ross, be placed in the embryological position,—that is, with the thumb directed outward and upward, the palm forward,—the preaxial border from the tip of the shoulder down to the metacarpo-phalangeal articulations of the index-finger and thumb is supplied by the fifth cervical root, and the postaxial border, from the axilla to the finger-tips inclusive, is supplied by the humeral branch of the second, the first dorsal, and the eighth cervical nerves. Observations made in cases of disease of the cauda equina have also convinced Dr. Ross that, if the lower extremities be also placed in the embryological or tailor position, the preaxial border is supplied by the cutaneous nerves of the four upper lumbar nerves, and the postaxial by the coccygeal and sacral sensory nerves. He has concluded also that the most distal parts of the preaxial border were supplied from the lower of the four lumbar nerves, and of the postaxial border by the higher sacral nerves.

The chief law of sensory distribution, as worked out by Herringham and adopted by Ross, is as follows:

"A. Of two spots on the skin, that which is nearer the preaxial border tends to be supplied by the higher nerve.

"B. Of two spots in the preaxial area, the lower tends to be supplied by the lower nerve; and of two spots in the postaxial area, the lower tends to be supplied by the higher nerve."

While many cases of disease limited to the anterior horns or to particular cell groups of these horns have been recorded, I do not know of any reports of lesions circumscribed in the posterior horns of particular segments of the cord. Most of our practical knowledge of sensory segmental localization is therefore to be derived from cases which have been reported by Ross, Thorburn, and others, in which both the cord and nerve-roots have been injured extensively. To the papers of these observers I will refer those interested for details, giving here only some of the summarized conclusions.

Thorburn,* for example, in one of his papers on spinal localization as indicated by spinal injuries, speaks as follows with reference to the distribution of anæsthesia in the upper limbs: "Dr. Ross has fully demonstrated the distribution of the sensory nerves in the upper limb. Regarding the limb in its embryological position, we find that it is projected as a bud from the trunk, the hand being supine and the radius upward, so that the palmar surface is anterior. In this position the bud carries out with it branches of the anterior primary divisions of the spinal segmental nerves from the fifth cervical to the first dorsal, inclusive; and as these nerves maintain in the adult their embryological relations, we have the several roots supplying the limbs in numerical order from the radial to the ulnar side. Hence, then, the higher the paralysis extends in the cord through the brachial region, the farther will the anæsthesia extend from the ulnar towards the radial side. This arrangement is fully demonstrated by our cases. It is necessary to refer again to the distribution which will be obvious to any one who takes the trouble to read the reports

* *Brain*, October, 1888.

and of which I have already spoken in my previous paper. It will be found that the fifth root supplies the region overlying the deltoid muscle, and the outer aspect of the arm and forearm as far as the styloid process of the radius or base of the thumb, and that the eighth cervical and first dorsal supply the little finger and inner side of the hand, forearm, and arm, the remaining roots providing for the central parts of the limb on both anterior and posterior aspects. It will, however, be found that these central roots supply relatively a much less extensive area than those above and below them."

In his paper on injuries to the lumbo-sacral region,* Thorburn likewise summarizes the sensory distribution of the various lumbo-sacral nerve-roots. This summary is as follows:

"First lumbar nerve: ilio-hypogastric and ilio-inguinal.

"Second lumbar nerve: outer (?) and upper part of thigh.

"Third lumbar nerve: anterior aspect of thigh below second lumbar.

"Fourth lumber nerve: anterior part of leg.

"Fifth lumbar nerve: Back of thigh, except the distribution of first, second, and third sacral.

"First sacral nerve: a narrow strip on back of thigh; back of leg and ankle; sole; part of dorsum of foot.

"Second and third sacral nerves: perineum, external genitals, 'saddle-shaped' area of back of thigh."

MOTOR LOCALIZATION.

Methods, anatomical, physiological, microscopical, clinico-pathological, and clinical, have all contributed their share to our knowledge of motor localization; and to some of the results obtained in each of these ways I will briefly refer.

ANATOMICAL RESEARCHES.

Herringham carefully and patiently dissected the nerves of the brachial plexus on many subjects, fœtal and older, in order to trace these nerves to their final destinations in the muscles and the skin. He gives a tabular statement showing the usual nerve-supply of muscles of the upper limbs, as follows:

"Third, fourth, and fifth cervical: levator anguli scapulæ.

"Fifth cervical: rhomboids.

"Fifth, or fifth and sixth cervical: supraspinatus, infraspinatus, teres minor.

"Fifth and sixth cervical: subscapularis, deltoid, biceps, brachialis anticus.

"Sixth cervical: teres major, pronator teres, flexor carpi radialis, supinator longus and brevis, superficial thenar muscles.

"Fifth, sixth, and seventh cervical: serratus magnus.

"Sixth and seventh cervical: extensor carpi radialis.

"Seventh cervical: coraco-brachialis, latissimus dorsi, extensors at back of forearm, outer head of triceps.

"Seventh and eighth cervical: inner head of triceps.

"Seventh, eighth, and ninth cervical: flexor sublimis, flexor profundis, carpi ulnaris, longus pollicis, and pronator quadratus.

"Eighth cervical: long head of triceps, hypothenar muscles, interossei, deep thenar muscles."

PHYSIOLOGICAL RESEARCHES.

Few experimental investigations with reference to the exact functions of the nerve-roots and horns of the spinal cord have been made. One of the most important and earliest of these researches was that of Ferrier and Yeo in 1880.† These investigations were as to the effects of irritation of the motor roots of the brachial and crural plexuses of monkeys. The faradic current was employed. It was found that each motor root represented a distinct functional combination. The muscles set in action were so related as to bring about a definite action of an adapted nature. The muscles affected by electricity exciting any one root were related in function. The relation was not simply one of contact or nearness.

The actions produced by the different roots were summarized by Ferrier as follows:

"First dorsal: action of the intrinsic muscles of the hand, muscles of the ball of the thumb, interossei, etc.

"Eighth cervical: closure of the fist, with pronation and ulnar flexion of the wrist, retraction of the arm, with extension of the forearm.

"Seventh cervical: the *scalptor ani* action,—viz., adduction with rotation inward and retraction of upper arm, extension of forearm and flexion of wrist and fingers, so as to bring the tips against the flank.

"Sixth cervical: the movement of 'atten-

* *Med. Chronicle*, April, 1889.

† *Proc. Roy. Soc.*, London, No. 212.

tion,'—viz., adduction and retraction of upper arm, extension of forearm, pronation and flexion of wrist, the palm of the hand being brought towards pubes.

"Fifth cervical: movement of the hand towards the mouth,—viz., raising the upper arm inward, flexion of the forearm with supination, and extension of the wrist and fingers.

"Fourth cervical: a similar movement of forearm and hand,—viz., the upper arm is raised upward and backward."

The actions of the *lower extremity* were respectively:

"Second sacral: action of the intrinsic muscles of the foot,—viz., adduction and flexion of the hallux, with flexion of the proximal phalanges and extension of the distal.

"First sacral: flexion of the leg, plantar flexion of the foot, flexion of all the toes at the proximal phalanges, and also of the distal phalanx of the hallux.

"Fifth lumbar: outward rotation of the thigh, flexion and inward rotation of the leg, plantar flexion of the foot, and flexion of the distal phalanges.

"Fourth lumbar: extension of the thigh, extension of the leg, and pointing of the great toe.

"Third lumbar: flexion of the thigh and extension of the leg."

Paul Bert and Marcacci,* in 1881, studied the distribution of the motor roots of the lumbar plexus, their researches being made on dogs and cats. The nerves were very carefully cut close to their origin, and stimulated electrically with the utmost care. "It was found that the first root of the lumbar plexus determines the contraction of the sartorius, the rectus, and the psoas muscles, which are closely connected in the dog and cat, and all of which flex the hip upon the trunk. The second root of the plexus excites contraction in the anterior portion of the vastus externus, a part of the tensor of the fascia lata, and the vastus internus,—*i.e.*, in the muscles which extend the leg on the thigh. The function of the third root is similar to that of the second, with some differences in detail. It excites part of the vastus internus, the anterior part only of the biceps, which is an extensor, while the posterior portion is a flexor. The fourth root causes movements in the posterior part of the biceps, the semi-tendinosus and the semi-membranosus (flexors of the leg and thigh), and the second and third adductors of the thigh, and the extensors of the thigh. It thus innervates three kinds of movements, which are in no respect opposed or contradictory. The fifth root presides over the movements of the tail. From these results the experimenters conclude that there is evidently a systematic arrangement of the innervation of the limbs at the origin of the nerves of the spinal cord; that is a functional systematization,—*i.e.*, the motor filaments arising at a given level are distributed to muscular masses, which act together and concur to produce an associated movement. In the second place (as Duchenne long ago demonstrated and as is now generally recognized), the anatomical unity of a muscle has no physiological correspondence. A single muscular mass may be in one part a flexor, in another an extensor. But the nervous distribution corresponds to the function, in so far as the different roots, innervating the several functions, are concerned."

Other researches, which are referred to by Ferrier and Yeo, have been made on the lower animals with a view to determine the situations of the roots of the plexuses of the limbs. Peyer and Krouse found that most of the muscles of the limbs were supplied by more than one root of the plexus. It was determined, among other things, that the muscles nearer the shoulder were supplied by the higher roots and those of the hand by the lower roots of the plexus; also that the sensory roots have a corresponding distribution to the distribution of the anterior roots.

During the operation by Dr. Abbe† on Dr. Dana's case of intractable brachial neuralgia several interesting experiments were made with the faradic battery, so far as I know the first of the kind on man. With a sponge electrode on the back, a metal-point electrode was applied at various points. When applied to the sixth nerve, just external to the dura, it caused contraction of the supra- and infra-spinati, rhomboid, latissimus dorsi, pectoralis major, teres, and deltoid. Application to the seventh nerve caused contraction of the pectoral, latissimus dorsi, and abductors of the arm; to the eighth nerve, similar contraction and pain.

MICROSCOPICAL INVESTIGATIONS: CELL-GROUPS WHICH REPRESENT PHYSIOLOGICAL UNITS IN THE HORNS OF THE SPINAL CORD.

Microscopical investigations show that in cross sections of the spinal cord a distin-

* The results obtained by Bert and Marcacci were summarized in the *Lancet* for October 1, 1881.

† *Medical Record*, February 9, 1889.

transverse localization of cell-groups which are related to certain definite muscles or muscular groups concerned in particular movements may be readily determined. The cord is not only an organ composed of a series of segments placed one above the other, but these segments differ in size both vertically and horizontally. The gray matter particularly shows marked differences in shape and size in various transverse sections. These differences depend largely upon the number and grouping of the cells.

Starr, drawing from various investigations, details at length the manner in which in the anterior horns of the cord the cells are arranged in distinct groups which can be determined and enumerated from within outward. He gives a series of diagrams which show the manner not only in which these cells are arranged in clusters at certain levels of the cord, but also how these continue or fail to continue in a vertical direction from one level to another.

These cell-clusters differ in number and in relative position at various heights in the cord. In the second cervical segment, for example, are three, two continuing downward into the third segment of the cord, the third even into the fourth segment. In the fourth cervical segment the number of groups is five. Again, in the fourth lumbar segment and below this as far as the sacral three groups are present. These groupings in the cord are enumerated and described by Starr and also by Gowers and Ross. The only point for us to remember in connection with practical localization is that each of these groups is probably a physiological unit. They are spinal centres of function comparable to the cerebral centres of motor function. Spitzka, in 1880, first advanced this opinion:

"The nearer the muscle is to the ventral aspect of an animal," he said, "the nearer will its nucleus be to the median line of the cord; and the nearer the muscle is to the dorsal aspect of the animal, the nearer will its nucleus be to the lateral cornu of the cord. Flexor nuclei are therefore in internal, extensor nuclei in external and posterior cell-groups. Thus the cell-group in the apex of the anterior horn as well as in the lateral cornu is fairly developed in the dorsal region, while the portion of the gray substance situated internally is deficient in cells, in evident relation to the deficiency of prevertebral muscles. To the extremities of the body, lateral extension of the cornua corresponds in these the same relative position of flexor and extensor nuclei is probable. As is shown in the enlargements, there is much more differentiation of the cell-groups in such extensions in the multidigitate animals than in the solipeds, as is shown by comparing the cord of man with that of the horse. Whether groups of muscles be flexor or extensor, it will be found that the nearer they are to the animal axis, the nearer will their nuclei be to the central canal. This is especially true of the flexor nuclei. The increasing development of a cell-group in the upper cervical region near the central canal in animals with powerful head and neck flexors seems to support this statement. Extensors remote from the axis, such as the trapezius, have their nuclei quite remote from the central canal." (Quoted by Starr.)

The diagnosis of a spinal lesion in the horns or columns of the cord may sometimes be at least of negative importance in deciding the question of operation. This was illustrated in the case of Lloyd and Deaver, of a cyst or extravasation of the cervical region of the cord. The lesion in this case was found to be a hemorrhagic extravasation in the anterior horns of the cord, practically out of reach of the knife. In this case, however, an external swelling which made operation important was present. If the external indications had not been present, the close diagnosis of the exact location of the lesion in a transverse section of the cord would have been of great importance. We have now data on hand for such localization at different levels. We can even make a fairly exact diagnosis of the position of a lesion at various positions from within outward in the anterior horns of the cord.

It may even be found that our knowledge of the exact position from without inward of these groups of cells which represent physiological units—which are, in other words, related to certain definite movements—may occasionally prove of practical value. Decision as to operating, for example, may depend not only upon our knowledge of the exact level and vertical limitations of a lesion, but also to some extent upon the amount of compression and of destruction by invasion of the spinal cord. As has just been stated, the nuclei of extensor muscles are situated in external and posterior cell-groups, while those of flexor nuclei are more internal; therefore, the predominance of extensor or of flexor paralysis may help sometimes to a conclusion as to the amount of transverse damage of the cord.

CLINICO PATHOLOGICAL AND CLINICAL INVESTIGATIONS.

As already stated, Thorburn has published certain clinical and pathological observations upon injuries to the cervical region of the spinal cord, and has endeavored to draw therefrom an accurate picture of the functions of each of the nerve-roots entering into the formation of the brachial plexus. His usual method consisted in noting accurately the distribution of the paralysis and anæsthesia which ensued immediately upon a lesion of the cord, of which the exact site had been determined by post-mortem examination; also of pursuing the changes which resulted from the consequent ascending myelitis. He has also applied the same methods to the lumbo-sacral or crural plexus.

He has tabulated provisionally, as follows, what he is led, from the evidences of his cases, to believe to be the arrangement, from above downward, of the muscle nuclei in the cervical cord:

"Fourth cervical nerve: supraspinatus and infraspinatus, teres minor. (?)

"Fifth cervical: biceps, brachialis anticus, deltoid, supinator longus, supinator brevis (?).

"Sixth cervical: subscapularis, pronators, teres major, latissimus dorsi, pectoralis major, triceps, serratus magnus.

"Seventh cervical: extensors of the wrist.

"Eighth cervical: flexors of the wrist.

"First dorsal nerve: interossei, other intrinsic muscles of the hand."

He has likewise summarized for the lumbo-sacral region of the spinal cord the arrangement of both the motor and sensory fibres of the nerve-roots. His summary, he states, is to be distinctly understood as only that for which his own cases gave evidence,—that is, they are positive evidence for the facts reported, but do not negative the existence of other facts the existence of which was not proved by the cases. Thus, for example, although no doubt the second lumbar root affords muscular branches, these are ignored because his cases yield no evidence of the same. His summary of the sensory arrangement has already been given. The following is the motor distribution as determined by him:

"First lumbar nerve: none.

"Second lumbar: none.

"Third lumbar: sartorius, adductors of thigh, flexors of thigh.

"Fourth lumbar: extensors of knee, abductors of thigh.

"Fifth lumbar: hamstring muscles.

"First and second sacral: calf muscle glutei, peronei, extensors of ankles, intrinsi muscles of foot.

"Third sacral: perineal muscles (erecto penis, transversalis perinei, accelerator urin etc.).

"Fourth sacral: bladder and rectum."

Ferrier,* in a paper on atrophic spin paralyses, has applied the facts determine by his and other experiments, and made provisional enumeration as a guide to furth more minute clinical research, of the muscl which are likely to be affected in poliomye tis limited to each segment, the muscles bei placed in the order in which they would pro ably suffer.

"First dorsal type: the intrinsic muscl of the hand, viz., muscles of the thenar a hypothenar eminences and interossei.

"Eighth cervical type: long flexors, uln flexors of wrist, intrinsic muscles of han extensors of wrist and phalanges, long he of triceps (pectoralis major?).

"Seventh cervical type: teres major, lat simus dorsi, subscapularis, pectoralis maj flexors of wrist and fingers (median), trice

"Sixth cervical type: latissimus dorsi, p toralis major, serratus magnus, pronat (flexor of wrist?) triceps.

"Fifth cervical types: deltoid (clavicul portion), biceps, brachialis anticus, serrat magnus, supinator longus, extensors of wr and fingers.

"Fourth cervical type: deltoid, rhombo supra- and infraspinatus (teres major), bice brachialis anticus, supinator longus, extens of wrist and fingers, diaphragm."

In the lower extremity:

"Second sacral type: intrinsic muscles the foot, strictly parallel to the first dor type.

"First sacral type: muscles of calf (plant flexors), hamstrings, long flexor of big t intrinsic muscles of foot.

"Fifth lumbar type: flexors and extens of toes, tibial muscles, sural muscles, perone muscles, outward rotators of the thigh, ha strings.

"Fourth lumbar type: extensors of thig extensor cruris, peroneus longus, adductors

"Third lumbar type: ilio-psoas, sartori adductors, extensor cruris."

On the principles of localization certa types of spinal paralysis have also been det mined and named by others, as by Rem and Erb. Remak speaks of an upper-a

* *Brain*, vol. iv. p. 226, 1881–1882.

type of atrophic spinal paralysis, in which are jointly affected the supinator longus with the brachialis anticus and the biceps and the deltoid. The same author describes the forearm type in which the extensors of the wrist and fingers, and the muscles of the hand are paralyzed. He has also described three types of paralysis of the lower extremities,—"The first in which the extensors and adductors of the leg are affected together, the sartorius muscle, however, escaping, although it is supplied by the anterior crural nerve, which also supplies the extensors; a second type, in which the ilio-psoas, sartorius, and flexors of the leg are affected together; and a third type, in which the muscles upon the leg and foot are involved with the exception of the tibialis anticus. He notices that the last-named muscle is rarely paralyzed with the other muscles, and that when it is affected, the other muscles moving the foot frequently escape." (Starr.)

SEGMENTAL LOCALIZATION OF REFLEX CENTRES.

Certain cells in the gray matter of the spinal cord preside over reflex action. These reflex actions, and the areas in which they are capable of being excited, are described in the more recent text-books. These centres are cutaneous or superficial, and muscular (or musculo-tendinous) or deep. The centres for these various reflexes are enumerated by Gowers as follows:

"Superficial reflex action: plantar, second sacral; gluteal, fourth lumbar; cremaster, second lumbar; abdominal, sixth to eleventh dorsal (epigastric, sixth dorsal); scapular, fifth cervical to first dorsal.

"Muscle reflex action: calf muscles (foot clonus), fifth lumbar and first sacral; knee-jerk, third and fourth lumbar; flexor digitorum, triceps, seventh cervical; biceps, supinator longus, sixth cervical."

An important set of reflex centres for localization purposes are those which preside over various actions more or less complex and involuntary. These include such as the following: Cilio-spinal, cremasteric, sexual, parturitional, vesical, and anal. Starr enumerates the position of these centres as follows: Cremasteric, first to third lumbar; vesical, third lumbar; rectal or anal, fourth lumbar. By other observers the cilio-spinal centre is placed in the lower cervical cord and dorsal, as far as the second or third dorsal vertebra. The sexual, or erection centre, has been placed without close localization in the lumbar cord, probably about the second or third lumbar segment. Korner has located what he terms the parturition centre at the level of the first or second lumbar vertebra. Those centres for complex reflexes which are really valuable for purposes of practical localization are the cilio-spinal, cremasteric, vesical, and anal centres; their position will be indicated in table at the conclusion of this article. The latest investigations of Thorburn and others indicate that the centres for the bladder and the anus or rectum are in the extreme lower part of the cord; in fact, in the terminal portion of the cord, the region of the third, fourth, and fifth sacral and the coccygeal nerve-roots.

VASO-MOTOR AND TROPHIC LOCALIZATION.

Vaso-motor and trophic centres are distributed throughout the entire vertical extent of the spinal cord. Those connected with the muscles are identical with or situated close by the corresponding motor nuclei in the anterior horns. Vaso-motor and trophic centres for the skin, nails, and joints also have a local habitation in the spinal cord. Pathological facts as those, for instance, which have been obtained in studying syringomyelia, point to the central gray matter of the cord as the probable seat of these centres. By the central gray matter I mean here that which is situated around or near the central canal. In the posterior portion of this central gray matter it is probable that the vaso-motor and trophic centres for the skin, nails, and joints are situated, while more anteriorly are probably placed the trophic centres for the bones. A special collection of large bipolar cells is found in the postero-internal gray matter, and extends in the form of a continuous column from about the seventh cervical to the second or third lumbar segment. This collection of cells first described by Lockhart Clarke is usually designated as Clarke's vesicular column, and has been referred to several times in this paper. It is now almost established by various pathological reports, and the careful anatomical and microscopical investigations of Gaskell, that this column represents a series of vaso-motor and visceral centres. Communicating nerves have been traced to and from this vesicular column to the ganglia and fibres of the so-called sympathetic nervous system. When, therefore, vaso-motor and trophic phenomena are present these regions of the central gray matter must be considered.

In 1884,* and again in 1888,† Starr summarized in tabular form the functions of the various segments of the spinal cord. His last table represents fairly well the status of spinal localization. In concluding this article I will give this table of Starr, with modifications based upon the results obtained by Herringham, Ross, Thorburn, and others. A study of this table, and of the various summarized statements which have already been given, will enable the diagnostician with approximate accuracy to localize the height of a lesion affecting the segments of the cord, or the spinal nerve-roots. In the column for sensation the cutaneous nerves are given in parentheses; this list is not complete, but it is hoped that it will be of assistance in sensory localization.

LOCALIZATION OF THE FUNCTIONS OF THE SEGMENTS OF THE SPINAL CORD.

Segment.	Muscles.	Reflex.	Sensation.
Second and third cervical.	Sterno-mastoid. Trapezius. Scaleni and neck. Diaphragm.	*Hypochondrium*(?) Sudden inspiration produced by sudden pressure beneath the lower border of ribs.	Back of head to vertex and neck. (Occipitalis major, occipitalis minor, auricularis magnus, superficialis colli, and supraclavicular.)
Fourth cervical.	Diaphragm. Deltoid. Biceps. Coraco-brachialis. Supinator longus. Rhomboid. Supra- and infraspinatus.	*Pupillary* (fourth cervical to second dorsal). Dilatation of the pupil produced by irritation of neck.	Neck. Shoulder, anterior surface. Outer arm. (Supraclavicular, circumflex, external (musculo-cutaneous) cutaneous.)
Fifth cervical.	Deltoid. Biceps. Coraco-brachialis. Brachialis anticus. Supinator longus. Supinator brevis. Deep muscles of shoulder-blade. Rhomboid. Teres minor Pectoralis (clavicular part). Serratus magnus.	*Scapular* (fifth cervical to first dorsal). Irritation of skin over the scapula produces contraction of scapular muscles. *Supinator longus.* Tapping the tendon of the supinator longus produces flexion of forearm.	Back of shoulder and arm. Outer side of arm and forearm to the wrist. (Supraclavicular, circumflex, external cutaneous, internal cutaneous, posterior spinal branches.)
Sixth cervical.	Biceps. Brachialis anticus. Subscapular. Pectoralis (clavicular part). Serratus magnus. Triceps Extensors of wrist and fingers. Pronators.	*Triceps* (fifth to sixth cervical). Tapping elbow tendon produces extension of forearm. *Posterior wrist* (sixth to eighth cervical). Tapping tendons causes extension of hand.	Outer side and front of forearm. Back of hand, radial distribution. (Chiefly external cutaneous, internal cutaneous, radial.)
Seventh cervical.	Triceps (long head). Extensors of wrist and fingers. Pronators of wrist. Flexors of wrist. Subscapular. Pectoralis (costal part). Serratus magnus. Latissimus dorsi. Teres major.	*Anterior wrist* (seventh to eighth cervical). Tapping anterior tendons causes flexion of wrist. *Palmar* (seventh cervical to first dorsal). Stroking palm causes closure of fingers.	Radial distribution in the hand. Median distribution in the palm, thumb, index-, and one-half middle finger. (External cutaneous, internal cutaneous, radial, median, posterior spinal branches.)
Eighth cervical.	Triceps (long head). Flexors of wrist and fingers. Intrinsic hand muscles.	.....	Ulnar area of hand, back, and palm, inner border of forearm. (Internal cutaneous, ulnar.)
First dorsal.	Extensors of thumb. Intrinsic hand muscles. Thenar and hypothenar muscles.	.....	Chiefly inner side of forearm and arm to near the axilla. (Chiefly internal cutaneous and nerve of Wrisberg or lesser internal cutaneous.)
Second dorsal.	.....	.....	Inner side of arm near and in axilla. (Intercosto-humeral.)
Second to twelfth dorsal.	Muscles of back and abdomen. Erectores spinæ.	*Epigastric* (fourth to seventh dorsal). Tickling mammary region causes retraction of the epigastrium. *Abdominal* (seventh to eleventh dorsal). Stroking side of abdomen causes retraction of belly.	Skin of chest and abdomen, in bands running around and downward, corresponding to spinal nerves. Upper gluteal region. (Intercostals and dorsal posterior nerves.)
First lumbar.	Ilio-psoas. Rectus. Sartorius.	*Cremasteric* (first to third lumbar). Stroking inner thigh causes retraction of scrotum.	Skin over groin and front of scrotum. (Ilio-hypogastric, ilio-inguinal.)
Second lumbar.	Ilio-psoas. Sartorius. Quadriceps femoris.	*Patellar.* Striking patellar tendon causes extension of leg.	Outer side of thigh. (Genito-crural, external cutaneous.)
Third lumbar.	Quadriceps femoris. Anterior part of biceps. Inner rotators of thigh. Abductors of thigh.	.....	Front of thigh. (Middle cutaneous, internal cutaneous, long saphenous, obturator.)
Fourth lumbar.	Abductors of thigh. Adductors of thigh. Flexors of knee. Tibialis anticus. Peroneus longus.	*Gluteal* (fourth to fifth lumbar). Stroking buttock causes dimpling in fold of buttock.	Inner side of thigh, leg, and foot. (Internal cutaneous, long saphenous, obturator.)
Fifth lumbar.	Outward rotators. Flexors of knee. Flexors of ankle. Peronei. Extensors of toes.	*Achilles tendon.* Over-extension causes rapid flexion of ankle, called ankle clonus.	Back and outer side of leg, and ankle; sole; dorsum of foot. (External popliteal, external saphenous, musculo-cutaneous, plantar.)

* *Am. Jour. Neurol. and Psych.*

† *Am. Jour. Med. Sci.*, May, 1888.

First and second sacral.	Flexors of ankle. Extensors of ankle. Long flexor of toes. Intrinsic foot muscles.	*Plantar* (fifth lumbar to second sacral). Tickling sole of foot causes flexion of toes and retraction of leg.	Back and outer side of leg and ankle; sole; dorsum of foot. (Same as fifth lumbar.)
Third, fourth, and fifth sacral.	Perineal. Muscles of bladder, rectum, and external genitals.	Vesical centres. Anal centres.	Back of thigh, anus, perineum, external genitals. (Small sciatic, pudic, inferior hemorrhoidal, inferior pudendal.)
Fifth sacral and coccygeal.	Coccygeus muscle.	.....	Skin about the anus and coccyx. (Coccygeal.)

ANTIFEBRIN IN THE TREATMENT OF EPILEPSY.

By Theodore Diller, M.D., Danville, Pa.*

NINE cases of epilepsy in this hospital in which the treatment by antifebrin was inaugurated were not in the least selected, but were simply taken in a haphazard way. As a matter of fact, they represent a wide dissimilarity in many respects; and it has seemed to me that a group of cases which would comprise as many phases of the disease as possible would be the best suited upon which to test the efficacy of a new therapeutic agent. The fact must not be lost sight of, however, that while these cases present important differences, yet they are all alike, in that each one has a degree of psychical disturbance which is considered by two reputable physicians to be of such nature as to require detention in a hospital for the insane. The drug was given, with more or less interruption, during a period of about four and a half months,—viz., during part of October, and all of November, December, January, and February. For greater convenience in calculation, and because of the possibility that the effects of the remedy were not fully established until after it had been administered a short time, I consider that the drug has been taken only during the months of November, December, January, and February last; but, in comparing number of fits occurring in these months with those which took place in previous months, it would be obviously unfair to include the month of October in either list. So, in drawing comparisons, this month is omitted from consideration.

The drug was administered three times a day, dry, upon the tongue. Dose: 4 grains, except in Cases III. and VIII., where this amount was doubled. As the powder is tasteless and practically insoluble, this mode of administration, I think, will generally be found to be the best. Some patients, however, might prefer capsules, and, of course, the dose could easily be given in this way.

For obvious reasons, the only observations which could be made in the space of four months of the effects of any agent in the treatment of epilepsy, would be upon the frequency and character of the fits, and to a less extent, upon the general physical, mental, and moral *status* of the patient. Any estimate of the drug as a *curative* agent, based upon such meagre data, would be immature and unprofitable.

I will as briefly as possible cite the cases, all females, and make comments upon them afterwards.

Case I.—Aged 29; admitted 1884. Case of nine (?) years' standing; dark hair and eyes; rather undersized woman; slight figure; fair physical health; intellect very dull. Sits quietly in one place all day. No history of head injury, but large cicatrix noted just back of left frontal eminence, probably result of an old burn.

Case II.—Aged 16; stupid, expressionless face; silly, unmeaning grin. At times she is quite cyanotic; comprehends only simplest ideas; unable to attend to personal wants. General health poor. Refused medicine very frequently.

Case III.—Aged about 40. Fits very violent. She is nervous and uncertain in her movements. Moderately bright at times. Has periods of violent excitement after a fit.

Case IV.—Aged 15. Mental power very limited. Silly in manner, and, after a series of fits, seems to be for a time totally unconscious of her surroundings. Fits can be controlled by the use of bromides, but this treatment has a marked depressing effect, both mentally and physically.

Case V.—Aged 34. Laborer's wife; has had epileptic fits for past nineteen (?) years. Mother is an epileptic. Fits of *grand-mal* type; often nocturnal; always violent. Patient reads, sews, etc. She is pretty bright mentally, but apt to complain of trivial matters.

Case VI.—Aged 43; single; average height;

* Assistant Physician in the State Hospital for the Insane, Danville, Pa.

slight figure; blonde; admitted 1884. History says she has from four to eight fits per week. Acts in a silly, child-like manner. Fits very violent.

CASE VII.—Aged 34; single; bright and ladylike ordinarily, but easily depressed in spirits; has violent outbursts of temper; unstable in character. Fits of *grand-mal* variety and without an aura.

CASE VIII.—Aged 42; married. Tall, thin woman; bilious temperament; stupid and morose. Sews and does light work pretty well; has periods of very violent excitement, which last several days. After they have subsided she has no remembrance of them.

CASE IX.—Aged 13; admitted 1887; very dull and stupid; gets fits in series; at times in the *status epilepticus*. Before actual onset of such a period she is usually much excited, tears clothing, throws any article she can out the window. Obstinate; apt to pick skin into open sores with pin. General health is poor.

The annexed table will be found convenient for drawing comparisons as to the number of fits occurring in each case while under the bromide and antifebrin treatments respectively.

The remedy appeared to be well borne in all cases. The mental and physical depression and gastric disturbance observed so often in the bromide treatment were not apparent. It will be observed that the greatest decreases in the number of fits under the antifebrin treatment are in Cases I. and V. There is less of a decrease in Cases III., IV., VI., and VIII., while in the remaining cases—II., VII., and IX.—there is slight increase. Of this last group, however, it may be said that the remedy did not have a fair chance, as it was so much of the time refused by the patient or set aside for a tonic treatment.

In Cases II. and III. no fits occurred in the month of September, and in Case IV. only one fit in each of the months of June and July. This while patient was under the influence of the bromide treatment. It shows well the strong controlling influence of this treatment when we compare the records with those of months immediately before or after the months mentioned. It will be noticed that no such marked contrasts are recorded under the antifebrin treatment. The antifebrin did not succeed in any one case, having an average of over ten fits a month, in completely abolishing the attacks during a single month, as was the case under the bromide treatment. Yet in

Table of Epileptic Fits.

Cases.	1888.								1889.		Average number of fits per month from May to September, inclusive.	Average number of fits per month from November to February, inclusive.
	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.		
I.	10	5	10	8	9	...	2	5	2	2	8⅗	2¼
II.	9	13	12	12	0	...	9	8	16	9	9⅗	10½
III.	17	38	10	11	0	...	11	12	10	12	15⅗	11
IV.	20	1	1	8	23	...	4	3	9	12	10⅗	7
V.	12	3	10	5	11	...	2	3	3	0	8⅗	2
VI.	7	6	12	5	7	...	8	4	5	3	7⅗	5
VII.	2	2	2	0	1	...	4	3	3	0	1⅗	2¼
VIII.	11	12	13	9	7	...	8	6	8	5	10⅗	6¾
IX.	4	8	4	10	3	...	3	10	9	4	5⅗	6¼
Total.....	92	88	74	68	61	...	51	54	65	47	76⅘	54¼

Cases I. and V. took the antifebrin during the four months continuously, except two weeks in December. The administration of the drug in the remainder of the cases was interrupted to a greater or less extent. This because of refusal to receive the medicine, mental excitement, etc.; but from December 2 to 14 the treatment was in all cases suspended because of a failure of the supply of the drug.

the two cases (I. and V.) responding best t the antifebrin treatment the seizures wer pretty uniformly diminished in number eac of the four months this treatment was pur sued. This is also, though in less degree true of the remaining five cases, particularl if we leave out of consideration Cases II. an IX.

To conclude, it may be said:

1. That in all the cases in which th

was given continuously there was noted a reduction in the number of fits, ranging from about twenty-five to seventy-five per cent., as compared with other months during which patients were on bromide and tonic treatments alternately.

2. The remedy was in all cases well borne, producing no apparent mental or physical depression. This in marked contrast with depressant effects noted after a course of bromide treatment.

3. No skin eruption was produced.

4. In any given case, in which a great number of fits are occurring, and where it is desirable to control them as soon as possible, the bromides would be of far more value than antifebrin.

VIBURNUM PRUNIFOLIUM AS A TEST FOR LABOR-PAINS.

By R. L. Hinton, M.D., Prescott, Arkansas.

HAVING read with great interest about all that has been written of this wonderful remedy, and having failed to see any mention of this, as I think, very important feature in its therapeutic value, I have thought that a brief report of my experience in this direction might be of interest to the profession. And I will only ask space to relate one case, which will show, in the best light and in the fewest words, what I want to communicate.

On December 11, 1888, I was called to see Mrs. W., aged 20, primipara, well proportioned and well developed. Her husband had engaged my services some months previously, and had told me that he would be after me about this time (see above date), said they had kept a correct count of the time, and were not mistaken, wanted me to bear in mind the date, and hold myself in readiness. Accordingly, he came, and, as he lived nine miles in the country, he insisted that we ride with all speed, for "he thought there was no time for swapping horses." We reached the place at about 10 P.M., found his wife apparently fully in the throes of labor, three or four of the neighbor-women on hand, including the patient's mother, quite a sprightly, intelligent old lady, with some obstetric experience. Their countenances all seemed to say, "Now, the doctor is here, she will soon get through, for surely all things are ready." As has been my habit for many [illegible]re her a teaspoonful of tr. viburnum in a little water, and sat down to await results.

She was soon easy, and, in less than ten minutes, dropped into a quiet sleep. At eleven o'clock I went to bed, leaving instructions to repeat the medicine if the pains came on again, and, if necessary, to call me up. I was not disturbed, and found the next morning that she had rested well and was feeling much refreshed. I then had a talk with her and her mother, to ascertain, if I could, whether there was not "a mistake in their count;" and my conclusion was that she ought not to be confined short of six weeks, of which, I thought, I had convinced them before leaving. I left directions for the viburnum to be continued three times a day, without fail, and if labor should set up, to give it every two to four hours, according to the urgency of the case, and send for me. In just three weeks I was called again, and in haste, her husband, who came for me, assuring me that there was no mistake this time. I arrived about the same hour as before, asked when she had taken a dose of her medicine. The answer was about three days ago. How long had she been suffering? Over two days, and gradually growing worse. Asked her why she had not taken her medicine. She said the women told her if she continued to take THAT MEDICINE she NEVER WOULD have her baby." I gave her a teaspoonful of viburnum, as before, assuring her that if her pains were natural and right, or, in other words, true labor-pains, she would go on and get through in good time; but, if they were not, she would get easy, as before.

She got easy, as before, and I went to bed, leaving directions as on my previous visit. The next morning found her, as before, refreshed, by being relieved of a night's unnecessary torture, and blessed with a comfortable, quiet sleep. I had another conference with her and her mother, told them I was still of opinion she would go three weeks longer, that I was certain of two things,—first, that her full time was not up; and, second, that if she would stick to my medicine, as directed, she would not send for me again before she needed me. Looks, as well as words, told me they were slow of faith. I finally told them that if they had more confidence in what the women would tell them than in my judgment, and if they were not willing to carry out my treatment in good faith, I would be compelled to abandon the case, and they could get other help. This settled the matter. They (she and her mother) both prom-

ised that the medicine should be taken regularly until I was sent for again. I left, assuring them that if they *did this* she would get through, when the pains returned, promptly and naturally. So, in three weeks, less one day, I was called the third time, and found her pains bearing down, natural and regular, occiput presenting, and in three hours she gave birth to a fine large male child. The secundines came away promptly; no hemorrhage. She made a good and speedy recovery. I never have post-partum hemorrhage, nor severe after-pains, and scarcely ever use anything but viburnum. I consider it the best remedy for both these troubles that we have, and I never have, in my practice, puerperal fever or convulsions. I usually keep my cases on this medicine till they are able to get up and dress.

I could relate cases similar to the above by the score, and there are other things I would like to say about black haw, but this article is already too lengthy. I will only add that I make a saturated tincture from the green root, of which I use about five gallons in my practice annually. I scarcely ever find it necessary to remain with my cases longer than to see the child dressed, after the mother is cared for; and, out of thirty-three years' practice, I have only had three forceps cases; these were on account of disparity between the dimensions of the fœtal head and the pelvic outlet. Only one serious perineal laceration, one slight, both primipara.

POISONING BY HYOSCINE HYDROBROMATE.

By D. W. Prentiss, M.D., Washington, D.C.*

In the February (1889) number of the Therapeutic Gazette are reported two cases of poisoning by hyoscine, which show this alkaloid to be a powerful and uncertain drug.

In one case, $\frac{1}{75}$ of a grain was given hypodermically to a man weighing two hundred pounds, and was followed by most active and distressing poisoning.

In the other case, $\frac{1}{50}$ of a grain was given hypodermically to a man, by mistake, and again alarming symptoms resulted. Both patients recovered the same day without bad results.

In the case here reported, $\frac{1}{100}$ of a grain of hydrobromate of hyoscine (tablets of Sharp & Dohme, of Baltimore) was given hypodermically, at 11 A.M., to a delicate woman, about 28 years of age. She had been accustomed to taking morphine and atropine in the same way for the relief of severe pain in the cervical spine, and on this occasion hyoscine was substituted, without her knowledge, in the hope that it might take the place of the morphine, of which there was danger of forming the habit.

In about three minutes after the drug was given dryness of throat and mouth was felt, face was flushed, and a very nervous, quivering sensation felt all over the body. The rush of blood to the head continued until the face was nearly purple. Sight was dim, pupils dilated very much, and patient seemed aware that she had taken some new remedy, asking, "What was given me?"

In a short time delirium occurred; she cried bitterly, seemed very nervous, and insisted upon sitting up in bed, though her efforts to do so proved her too weak.

In half an hour's time limbs seemed torpid; could only raise her hand with great difficulty; eyelids were so stiff that she could not close them. Nausea felt in twenty minutes after taking the drug; continued several hours.

The patient complained of a sinking sensation, and those about her thought several times she was failing fast. Delirium nearly all the time; patient greatly depressed, and talking in a most despondent way, this being very unnatural for one of her cheerful disposition.

In the afternoon she seemed to be in a stupor, though roused at times and spoke. In five or six hours the effects of the drug seemed to wear off, and she was herself again, though very much weaker.

NOTE ON THE DOSE OF IRON.

By W. W. Jaggard, M.D., Chicago, Ill.

THE topic that heads this paragraph is of greater practical moment than is at first apparent. Considerable difference, both of opinion and of practice exists upon the subject of the size of the therapeutic dose of iron. As a rule, quantities of the metal are

* Professor of Materia Medica and Therapeutics, Medical Department, Columbian University, District of Columbia.

exhibited that are far in excess of the needs of the body, and far above the amount that can be absorbed. Thus Goodell, although commonly a very judicious prescriber, urges the exhibition of Blaud's pill in the following liberal way:

"During the first three days one pill is to be taken after each meal. On the fourth day, four pills are taken during the day. On the fifth day, five pills; on the sixth day, six,—that is to say, two pills after each meal. For three days more, six pills are taken daily; then the dose is to be increased by one pill daily, until three pills are taken after each meal. On this final dose the patient is kept for three or four weeks, as the case may be. In stubborn cases I have occasionally run up the dose to the number of five pills thrice daily, and have seen no other bad effects from it than a feeling of fulness in the head." *

How much metallic iron is thus introduced into the patient's alimentary tract? Blaud's pill, according to Goodell's formula, is composed of 2½ grains each of dried ferrous sulphate and pure potassium carbonate. If we assume the molecular weight of the iron salt to be 170, each pill will contain .82 grain of the metal. When the patient takes 1 pill after each meal, she receives daily about 2½ grains of metallic iron, and when the final dose of 3 pills after each meal is reached, she ingests nearly 7½ grains.

Now, anæmia is the chief, if not the only, indication for iron in the class of cases in which the mode of administration just outlined is advised. But in anæmia, iron, so far as we know, is a food rather than a medicine, since it is supposed to be an essential constituent of hæmoglobin and therefore a necessary integrant portion of the red blood corpuscles. If iron simply acts the part of a food for the red blood disks, its *rôle* is limited. The quantity exhibited must bear some relation to the actual needs of the red blood corpuscle.

The amount of iron present in the red blood corpuscles under conditions of health is a determinate quantity. It has defined limits that are by no means wide. Modern physiology teaches us what these limits are. Professor McKendrick,† in his "Address in Physiology" writes: "The blood of a man of average size may be taken at 4536 grammes, or about 10 pounds. Such blood contains about 13.083 per cent. of hæmoglobin, or about 1¼ pounds. As regards the iron, 100 grammes of blood contains .0546 gramme. It follows that the total amount of 4536 grammes contains about 2.48 grammes, or nearly 39 grains." It is obvious that under the daily exhibition of 3 of Blaud's pills—about 2½ grains of iron—a quantity of the metal is soon introduced into the body that is equal to the amount normally present in the total blood-mass. Under the daily administration of 9 pills,—nearly 7½ grains of the metal,—the final dose that is to be continued for three or four weeks, the saturation point may be reached within a very few days.

To establish a valid objection to this continual overdose of iron, it is not necessary to prove direct injury to the individual from the use of the method. It is quite sufficient to show that these large doses are not necessary. As a matter of fact, the surplus of the drug passes out of the alimentary tract along with the fæces, and does comparatively little harm aside from the occasional disturbance of an already enfeebled digestion.

Overdoses of iron are more common when the tincture of ferric chloride is used as the chalybeate. Twenty-five minims of this preparation contain about 1 grain of metallic iron. Under the enormous doses of this remedy that are so often prescribed, the saturation point is usually passed much sooner than in the case of Blaud's pills.

* "Lessons in Gynæcology," p. 151. Philadelphia, 1887.

† Fifty-sixth Annual Meeting of the British Medical Association, Glasgow, 1888 (*British Medical Journal*, August 18, 1888)

A CASE OF SPONTANEOUS COMBUSTION IN MAN.

By Floyd Clendenen, M.D., La Salle, Illinois.

DR. G. A. STOCKWELL, of Port Huron, Michigan, writing in the Therapeutic Gazette for March on "Spontaneous Combustion of the Human Body," called to mind a peculiar case which came under my observation while coroner of La Salle County, Illinois. I will give the facts, and then leave it to the judgment of those who may be seeking evidence *pro* and *con* on this subject, upon which we have all read "but knew no more."

On Christmas morning, 1885, I was telephoned to go to Seneca, a village in the eastern part of the county, to hold an inquest on the bodies of Mr. and Mrs. R., who were

found dead in their farm-house, near said village.

I immediately got on a train, and in due time was at the scene of disaster, where I found a large crowd of curious spectators. I at once empanelled a jury of the most intelligent citizens, one of whom was an M.D., and proceeded to investigate. The first thing that attracted our *particular* attention was the peculiar sickening odor which pervaded everything in and about the large frame farm-house where the accident occurred. The inner walls of the house and the furniture were heavily coated with a dirty, greasy, sooty substance. We found the house was occupied the night preceding by Mr. R.and wife, an aged couple of Irish people, who were both—more especially the old lady—addicted to the excessive use of whiskey, and an old Swedish man, who was almost an imbecile and *perfectly* harmless. The latter invariably got up at five o'clock, but on this occasion he did not arise until near eight o'clock, and was scarcely able to give the alarm to neighbors near by owing to his being nearly asphyxiated in his room, which was in the upper portion of the house and the doors closed between. He died two weeks later from the effects of the poison inhaled that night, as supposed.

On entering the house we found Mr. R. lying dead on the floor by his bed, adjoining the kitchen, his room-door being ajar. In the kitchen we found the furniture all in its usual place. A tallow candle on the table, one-third burned, appeared to have been extinguished by Mrs. R., as it was her custom to be the last of the household to retire. (They did not use anything but common candles for illuminating the house.) We found a hole burned in the kitchen floor (which was made of inch pine boards) two feet six inches by about three feet square, the earth being about two feet below the floor. Eight feet from this hole in the floor was the kitchen range, in which, subsequent proof showed, the fire had gone out at 8 P.M. on the 24th, or night of the accident. Upon examining the opening in the floor we discovered a mass of cinders on the ground beneath. Upon removing them, we found the skull, the cervical, and half the dorsal vertebræ reduced very nearly to a cinder, also about six inches of the right femur, together with part of ilium in about the same state as the vertebræ. The feet were found in the shoes; the left foot was reduced to a cinder, the shoe being partially calcined. The other foot and shoe were reduced to a complete cinder. The other parts of the body and clothing were reduced to a *very light* cinder, leaving *no* shape of former body. The clothing entirely gone. Upon removing, the entire remains of Mrs. R., who a few hours previous had weighed one hundred and sixty pounds, were now placed in a box that would hold less than one bushel. The entire remains weighed twelve pounds. The evidence disclosed the fact that Mrs. R. had been an habitual drinker, had drank more than a quart of whiskey during the previous day, was intoxicated when last seen alive, at 8 P.M. It appeared as if Mrs. R. had burned on the floor without a struggle, but why the floor did not continue to burn is a mystery. The pine joist against which the remaining cinders lay were slightly charred, but not burning when found.

There was not any evidence of a blaze having occurred. The skull and hip bone were really the only evidence by which it could be told that a human body had been cremated there.

ADDITIONAL NOTE ON THE TREATMENT OF YELLOW FEVER.

By Geo. M. Sternberg, Surgeon U.S.A.

I WISH to add the following postscript to my paper on the treatment of yellow fever:

I have just received a letter from Dr. Reuben Cleary, an American physician practising in Rio, in which he says, "In all I have treated thirty-four cases of yellow fever, all of them genuine, but as about one-half did not present albumen in the urine nor 'black vomit,' they might be contested, yet they all began with sudden chilliness, then excessive temperature, mostly with dry skin (temperature, 39.9° to 40.5°), which lasted from twelve to seventy-two hours, abating somewhat; tongue whitey yellowish, skin yellow, great hyperæmia of the thoracic integument, some diminution of the urine, gastric uneasiness, and vomiting. In my opinion and that of an experienced Brazilian physician they were undoubted cases of yellow fever. Of the *thirty-four*, I lost only *one*,—that is the one I wrote you about,—and in every case I used your formula steadily throughout. In one case I gave 3 litres. I found it better to use 3 centigrammes of the mercuric bichloride, and gave it in ʒi-doses ice cold. also controlled the heat with antipyrin o

antifebrin, and gave appropriate medicaments for gastric and other symptoms as they presented themselves."

I also wish to correct the following mistakes in my paper, as published in the THERAPEUTIC GAZETTE of May 15:

Page 299, second column, eleventh line from top, for 29 22 read 22.72.

Page 303, second column, in the formula, as prescribed by Dr. Sollace Mitchell, for "aquæ puræ, ℥iv," read aquæ puræ, ℥iv.

HAVANA, May 12, 1889.

ON THE TREATMENT OF WHOOPING-COUGH BY ANTIPYRIN.

Coincidently with the progress which has been effected of late years in the etiology of the infectious diseases, there has been progress in therapeutics, but not equal progress. It might have been expected that of all these diseases, among the first to profit by the new etiological acquisitions would have been pertussis and diphtheria, diseases in which, according to the microbiologists, the infectious germs have a primary localization in parts fairly accessible; it cannot, however, be said that the antiseptic treatment of these diseases has yet achieved brilliant success. Hippocrate Callias, it is true, claims remarkable results in diphtheria from sprays of resorcine, while Gaucher and Dubousquet think they have saved nearly all their patients by local applications of very strong solutions of phenic acid. But the communications of all these gentlemen were received with no little incredulity when read before the learned societies, and certainly many other excellent authorities who have thoroughly tried the local germicide treatment, while awarding to antisepsis in diphtheria high praise, speak guardedly and by no means boastfully of the results which they have attained.

So with regard to whooping-cough, Ollivier, physician to the Enfants Malades, in the *Bulletin Général de Thérapeutique* (March 30, 1889), testifies to the generally unsatisfactory results of the germicide therapy of this disease. Tar vapors and turpentine vapors have been tried, and fumes of sulphurous acid, while phenic acid sprays have been used day and night; so, also, creoline, resorcine, petroleum, quinine, and benzoate of sodium in pulverizations; but this topical medication, however faithfully carried out, has never, says Ollivier, shortened the duration of whooping-cough by one day, nor has it ever markedly alleviated the paroxysms of coughing, or prevented any of the complications. It is impossible, he asserts, to charge the air of inspiration with a sufficient quantity of any antiseptic agent to destroy the pertussoid germs burrowing in or beneath the epithelium of the laryngeal mucosa. Better than all antiseptics, he says, is change of air; oxygen is itself a parasiticide.

Despairing of successfully meeting the casual indication, Ollivier would content himself by treating symptoms and complications, and especially by quieting the hyperexcitability of the vagus centre by means of nerve sedatives. He has nothing very new to offer for the accomplishment of this end. He speaks favorably of antipyrin.

At a recent meeting of the Société de Thérapeutique, Dubousquet-Laborderie read an interesting paper on the treatment of whooping-cough by antipyrin. He has treated ninety-four cases with general success; he claims that the duration of the disease in the majority of these patients was markedly shortened. The sedative effects of the medicine on the cough-paroxysms were perceptible from the very first. In seventy-one of Dubousquet's cases, the average duration of the disease was twenty-four days, instead of forty-four to fifty, which is the ordinary duration. He accepts Trousseau's definition of pertussis,—"a specific pulmonary catarrh with neurosis,"—and believes that antipyrin benefits this disease by addressing itself to the two elements,—*specificity* and *neurosis*. As the nervous or convulsive element predominates in pertussis, it is probably chiefly by allaying hyperexcitation and spasm that it does good. One remarkable effect of the antipyrin treatment was the diminution in the number of pertussoid paroxysms,—*i.e.*, from twenty-five or thirty fits of coughing a day to half that number, or even less. The intensity of the paroxysms was also greatly abated.

The doses prescribed by Dubousquet vary from five to fifteen grains per day to children under three years of age, and from twenty to sixty grains a day to older childern and adults. To a child of five years of age, a 5-grain dose may be given after each fit of coughing till three or four doses have been taken. To an adult, the dose may be twice as great. The medicine may be given in raspberry sirup and Vichy water. He prefers to begin with full doses, which may be increased or diminished, according to the indications.—*Boston Medical and Surgical Journal*, May 16, 1889.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
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GEO. S. DAVIS,
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Leading Articles.

THOUGHTS ON URIC ACID.

THE question of uric acid in its relations to urea, to food, to drugs, and to disease is one of such importance that we need no apology for referring to the work of Dr. A. Haig in his thesis for the degree of doctor of medicine in the University of Oxford, 1888, and in the sundry other publications since; see especially "St. Bartholomew's Hospital Reports," vol. xxiv. The theory which A. Haig especially puts forth, and which he claims to have substantiated by a large series of experiments, teaches that the formation of uric acid has a normal relation to that of urea (the relation being as 32.6 to 1), and that this normal relation is constant in health, in disease, under all diets, and all medications. He believes that a diet, a medicine, or a mode of life, or a morbid process which increases or decreases the production of one of these principles, alike increases or decreases one or the other; but that certain dietetic substances, medicines, habits of life, disease, or diathetic conditions have the power of checking, not the formation but the *excretion* of uric acid, and thereby causing the storing of uric acid in the system, which urid acid in turn becomes a source of irritation and disease; and, further, that this uric acid, when heaped up in the liver, spleen, or other organ or tissue, causes a local disease; but when swept out into the alkaline blood produces general lithatemic symptoms, such as headache, hypochondriasis, epilepsy, neuralgia, etc.

If the theory of Dr. Haig be correct, exercise, alkalies, or other procedures which cause a liberation of uric acid that has been stored up in the tissues, and a solution of it in the blood must at first increase all symptoms which are due to the presence of uric acid in the system. As the result of his clinical experience and experiments our author even goes so far as to affirm that at least in some cases epileptic explosions, and even acute mania, have been the result of a setting free of uric acid that had gradually accumulated in the system. The central idea of the thesis of Dr. Haig, the asserted constancy of the relation between the formation of uric acid and urea in the system, under all circumstances, is, to us at least, a novel one. Sometimes gouty people seem to be worse at first after the change of their habits of life, a result readily explainable by the theory of Haig. On the other hand, we have never yet seen a patient in whom there was a primary increase of the symptoms of a gouty diathesis produced by the exhibition of salicylic acid. We are, therefore, not as yet prepared to admit the truth of the theory, especially as it seems to be against the general teachings of physiological chemistry. The relation of uric acid to urea is not yet thoroughly established, but we believe most authorities incline strongly to the view that the acid is—what the Germans call a *Vorstoff*— a product in the formation of urea,—*i.e.*, a material which has undergone partial degradation, but has not yet reached the urea stage. If this be correct, it seems to us entirely improbable that neither food, nor medicine, nor life-habit should have the power of checking midway the process which eventuates in the production of urea, and thereby causing an increase in the formation of uric acid.

However much of truth or of falsity there may be in the chief theory advanced by Dr. Haig, some of his minor generalizations, based upon his own chemical work, are very interesting. He has found that an increase in the acidity of the system diminishes uric acid excretion. The acidity of the system may be increased by the administration of acid or by

administration of certain foods. Those foods which increase acidity, according to our author, diminish uric acid excretion, and those which diminish acidity increase uric acid. Foods may increase acidity by the acid or acid salts that they contain, or by causing dyspepsia and acid fermentation in the gastro-intestinal contents, or they may diminish the acidity by the alkali which they contain.

The iodide of potassium Dr. Haig found, when given in large doses, to act like an alkali, increasing the general alkalinity of the system, and also the excretion of uric acid. Phosphate of sodium in most of his experiments notably increased the excretion of the acid; in some of them it diminished the excretion, but in all of these cases it was found by chemical analysis that the alleged pure phosphate contained a considerable amount of the sulphate of sodium, and the sulphate of sodium was found to have a remarkable power in lessening the excretion. Iron also lessened excretion; a fact which seems to account for the headaches which iron is very apt to produce in gouty subjects. Lead also diminishes the uric acid output; this, in turn, seems to explain the rare cases in which plumbism or chronic lead-poisoning has for its chief manifestation gouty joints and gouty arteries; we have certainly seen podagric symptoms, not to be distinguished from those of ordinary gout, produced by lead.

In regard to alcohol, Dr. Haig seems to believe that it is not so much the alcohol in the wine, ale, or porter which causes gouty manifestations, but the acids which these beverages contain, or which they are liable to produce in the alimentary canal. The salicylates augment the excretion of uric acid most remarkably, their power being such that they are able to dominate almost every substance which decreases excretion, so that, in spite of presence of acids, the salicylates produce a great increase in the throwing off of uric acid.

Another point of some importance made by Dr. Haig, of which in practical therapeutics we perhaps do not think sufficiently often, is the failure of drugs to act on account of their failure to enter the system. Thus, in a case of epilepsy, related by Dr. Haig, on several occasions the urine gave no reaction with perchloride of iron during the fits, though on some occasions there was probably as much as twenty grains of the salicylate lying in the stomach, and there was a strong reaction in the urine voided after the fits had passed off, without any more of the drug having been given.

SALICYLATE OF MERCURY IN SYPHILIS.

THE neutral salicylate of mercury—a white, amorphous, tasteless, and odorless powder, scarcely soluble in alcohol and water, and having the formula $(C_6H_4OHCO_2)_2Hg$—was first introduced as a remedy in the treatment of venereal affections by Dr. Silva Araujo, of Rio Janeiro, who claimed for it that it had less influence upon the alimentary tract, and was better borne by the system, than any other preparation of mercury, and that its action in syphilis was exceedingly energetic and effective, so that it sometimes brought relief when the older preparations of the metal had failed. The publications of Araujo were followed by a number of papers from Brazilian physicians, and also attracted attention in Europe. In 1887, Szadek, of Kiew, especially commended the remedy as an injection in cases of gonorrhœa, employing the following formula:

Hydrargyri salicylatis, .10 (gr. iss);
Aquæ destillatæ, 250 (℥viss);
Sodii bicarbonatis, 1 to 1.3 (gr. xv to xx). M.D.S.

He also gave details of twelve cases in which he had practised one hundred and twenty intramuscular injections of the salt with most excellent result. For this purpose he employed the following formula:

Hydrargyri salicylici, .2 (gr. iii);
Mucilag. gummi arabici, .3 (♏x);
Aquæ destillatæ, 60 (℥iss). M.D.S.

He gave the injections at intervals of two or three days, and repeated them from six to twelve times in an individual case. He especially affirmed that the salicylate produced, when injected under the skin, absolutely no disagreeable local manifestations.

Dr. Epstein, of Nürnberg, in experiments in which he injected upon one side the salicylate and the other calomel, found that the salicylate was much less apt to produce local symptoms than was the other mercurial.

Dr. Arthur Plumert, of Prague, did not obtain extraordinarily good results in gonorrhœa with the injections of salicylates; but, on the other hand, confirms its value in the treatment of syphilitic troubles; especially does he commend its hypodermic use. In not one of the twenty-four patients upon whom he employed these injections were there any local symptoms, but in one case stomatitis followed.

Drs. Jadassohn and Zeising, assistants of Professor Neisser, of Breslau, employed a

ten per cent. solution of the salicylate in a pure liquid paraffine, and treated one hundred and forty-one patients with four hundred and forty intramuscular injections. In forty-five of the patients there were slight local symptoms, and in four cases these symptoms were somewhat severe. In all cases the effect upon the specific disease was very rapid and pronounced.

Professor Neumann, at Vienna, has employed with satisfaction the salicylate internally in the form of pills in twenty recent, and one old, cases of syphilis. He also in eleven cases used the hypodermic injections without ever noticing any local irritation.

In a recent thesis upon the subject, Theodore Schreus reports a number of cases which have been treated in the clinic of Doutrelepont with hypodermic injections of a ten per cent. suspension of the salicylate in paraffine, the size of the injections being such that the patient received each time 1½ grains.

The whole list of reported cases in which the mercurial salicylates has been employed intramuscularly amounts to two hundred and nineteen, with fifteen hundred and eighteen injections, and there seems to be a general consensus of opinion as to the value of the method and the freedom of the preparation from irritant properties. This record would seem to be sufficient to demand a careful study of this preparation by American syphilographers.

DEVENTER'S METHOD OF DELIVERING THE AFTER-COMING HEAD.

A HOPEFUL sign of the times with us is presented in the increased interest in the advancement of the science and art of obstetrics. Hopeful, since during the last ten or fifteen years attention has been largely concentrated upon the maladies peculiar to the non-pregnant female. This indication is all the more gratifying since it implies the ultimate limitation of certain modes of pernicious activity in gynæcology so-called.

Parvin* has recently made a forcible appeal for the more exact study of obstetrical operations. Now, while his plan is totally impracticable in our large metropolitan schools, on account of the size of the classes and the brevity of the term, still every member of the profession must commend his words. Volume ii. of the "Transactions of the Ninth International Medical Congress" also bears evidence to the revival of obstetrical learning in the United States. For the first time in the history of the Congress, there appears a section (iv.) that is devoted to midwifery. This division of gynæcology into two departments is to be regretted, since the subject is essentially unitary in character, yet, as the crude expression of renewed interest, it is ground for congratulation. Many of the papers published in this volume under the "Section of Obstetrics," must be regarded with charity, not so much for their intrinsic value, but as the sign of a general awakening to the fact that midwifery has been sadly neglected of late.

Out of the numerous contributions several may be selected of uncommon merit. One of the best of this class bears the caption, "A Study of Deventer's Method of Delivering the After-coming Head," by John Bartlett, M.D., Chicago. It is the object of this paragraph to present the outlines of this paper, and to add a word or two in criticism.

The following sentences descriptive of the method have been collected by Dr. Bartlett from several passages in Deventer's book:

"The infant, being turned gradually till it lies with its belly downward, is extracted till he is out above half-way, and then it is time for the woman to labor, as we have elsewhere shown; for now the head and arms are to pass through at once, and though all authors that I know of teach the contrary, requiring that the arms be extracted one after another and should be placed along the body, yet I both think and have found the contrary. Wherefore, I positively advise that the arms be left about the head, to be extruded along with it. I confess that the woman is obliged to force the infant with all her endeavors, but, like a small cloud, 'tis soon over. I most commonly prevent the woman from having pain till the infants are come so far (half-way out), then, allowing a little rest and encouraging her, I positively promise that if she performs her part courageously the birth will be presently performed; only for that purpose she must use all her strength to bring the infant forth, behaving herself as if the pains were pressing; pressing down with all her force; which, if you see the woman doing, she must be faithfully assisted by drawing the infant downward and with force, yet cautiously. I say downward, not upward; not according to the woman's length, as most midwives used to do, but downward towards the intest—

* Address before the American Academy of Medicine, 1888.

rectum; otherwise the infant would be wedged in tightly, and it could not shoot through easily. The greatest care should be taken that the head and arms pass together, which may be done commodiously and without danger to life, after the manner mentioned."

It is from Smellie, however, that we receive a more exact description of the procedure, at well as some notion as to the indications for the operation. Smellie writes: "Deventer and others have directed us to press the shoulders of the child downward, so as to bring the hind-head first from below the os pubis. . . . When the forehead is hindered from coming down into the lower part of the sacrum by an uncommon shape of the head or pelvis, and we cannot extract it by bringing it out with a half-round turn at the os pubis, we must try to make Deventer's turn in the contrary direction, and, instead of introducing our fingers into the child's mouth, let the breast of it rest on the palm of your left hand (the woman being on her back), and, placing the right on its shoulders, with the fingers on each side of the neck, press it downward to the perineum. In consequence of this pressure, the face and chin, being within the perineum, will move more upward and the head come out with a half-round turn from below the pubes; for the centre of motion is now where the fore part of the neck presses on the perineum."

The advantages claimed for Deventer's method by Dr. Bartlett are:

1. What Barnes might call the decomposition of the wedge of the shoulders; in lieu of the bis acromial diameter presenting at the superior strait, it is the bis-axillary diameter.

2. The arms, extended upon the head, bridge over the space between it and the body; thus extended, they (*a*) act as fenders for the cord, keeping open channels, through which the funis may pass uncompressed; (*b*) they antagonize that spastic contraction of the uterus, which, closing in upon the lower circumference of the after-coming head, is one of the causes of fatal delay in delivery in these cases.

3. By this method the delivery of the after-coming head is very greatly simplified. In the majority of instances it may be unnecessary to interfere with the attitude of the head. Deventer claims that, with few exceptions, the head will "shoot through" both straits easily.

4. The delivery by extension is very much more expeditious than the ordinary method. [illegible]ıe is not lost in bringing down the arms, inserting the fingers in the child's mouth, etc. As a consequence, if the experience of Deventer is to be relied upon, it would seem to be safer for the mother, and very much safer for the child, than other methods.

The cases, in which Deventer's method has been tried within recent years by Dr. Bartlett and others, are too few in number, and, also, too imperfectly described to add much to or to detract seriously from the value of the procedure. The only instance of an accurately recorded case that has come under our observation is contained in the paper read by Dr. J. H. Chew before the Chicago Medical Society, December 27, 1888.* At present, then, the value of Deventer's method rests largely upon theoretical claims.

Let us inquire into the nature of these alleged advantages as they have been formulated by Dr. Bartlett.

Turn for a moment to the normal mechanism of the delivery of the thorax and head in either natural or artificial breech presentations. Select, for example, the first position. The shoulders, with the arms in their normal attitude,—*i.e.*, *the arms to the sides of the chest, the forearms crossed over the anterior thorax*,—pass the os uteri and the superior strait in the left oblique diameter. Under favorable conditions, when the resistance of the pelvic walls and floor is encountered, the left shoulder is rotated from right to left, while the right shoulder is rotated from left to right, until the bis-acromial diameter of the fœtus is coincident with the antero-posterior diameter of the pelvic outlet. The thorax is born with the arms still in the same relative habitus. Wiedemann, Velpeau, Desormeaux, Madame Lachapelle, and Hodge have all ably maintained this doctrine with reference to the attitude of the arms, in opposition to the notion, countenanced by Baudelocque, "that the arms will remain elevated along the sides of the head in pelvic deliveries." It seems to us that Dr. Bartlett is inclined to Baudelocque's view, erroneous though it is.

The head enters the superior strait with its long diameters coincident with the right oblique diameter. The normal attitude of the head under these conditions is that habitus in which the chin is flexed upon the sternum. As the head passes through the pelvis, flexion is increased, so that, as aptly

* Transactions of the Chicago Medical Society, December 27, 1888, p. 15 (*Supplement* to *Western Medical Reporter*, February, 1889).

described by Hodge,* "When the process goes on naturally, there is a *presentation of the small extremity* of the ovoid of the head, which involves the important fact that we have the same short diameters of the head concerned as in presentations of the vertical or greater extremity of the head. For it follows that when the chin is towards the centre of the os uteri, or superior strait, it points towards the coccygeal region, and therefore the posterior fontanelle, or vertex, points to the fundus of the uterus. Hence the occipito-mental diameter is coincident with the axis of the uterus and that of the superior strait."

Responsible opinion is unanimous upon the point that the normal mechanism, here outlined, offers the most expeditious mode of delivery, while, at the same time, it involves the minimum degree of danger to the perineum.

It follows that the method of extraction is best that imitates most exactly the natural mechanism of labor. Now, obstetricians the world over, whose opinions are at all authoritative upon the point, unite in the concession that the so-called Smellie-Veit method patterns most closely after the natural mechanism. This method consists in the liberation of the shoulders, and in the extraction of the head by traction applied over the shoulder-girdle, while the chin is flexed by the finger applied through the mouth to the lower jaw. As pointed out by Winckel,† the present appellation is a misnomer, since the method was described by Mauriceau in 1668, and perfected by Lachapelle in 1821.

If we accept the proposition just stated,—and assent cannot justly be withheld,—we must reject the "particular advantages" (3 and 4) respectively claimed by Dr. Bartlett. Dr. Knox's query is certainly pertinent: "Why should we provoke a malposition, and then hunt for a new method of delivery?"

As regards advantage No. 1, the wedge of the shoulders is not decomposed; it is only reversed in direction. No mechanical advantage whatsoever is gained.

Advantage No. 2 seems so highly hypothetical, even fanciful, that it scarcely deserves serious consideration.

Deventer's method is of undoubted value in certain exceptional cases, the nature of which has been pointed out by Smellie. When, for any reason, the arms cannot be liberated with ease, when the chin is extended and cannot be flexed, after the failure of the more reliable procedures, there is presented a plain indication for the use of Deventer's method.

Dr. Bartlett's paper is of greatest interest from quite a different point of view than that of utility in practice. The essayist was enabled to unearth the Dutch obstetrician's secret only through the careful reading of Smellie's works, proof, as remarked by Professor Simpson, of the importance of the relative study of the works of contemporary writers. The paper is a typical example of patient research into the wisdom of the ancients. This field of archæological inquiry has found but little representation in the medical literature of the United States, and a contribution of the nature of Dr. Bartlett's is necessary to prove the versatility of the national mind. But, inasmuch as we fail to perceive the great practical value of Deventer's method, we cannot regard Dr. Bartlett's discovery as an instance of the truth of the apothegm, "Time is like a river, which has brought down to us things light and puffed up, while those which are weighty and solid have sunk."

ANTIPYRIN IN DIABETES.

IF one could believe all that has been written about antipyrin, it certainly could claim the title of "universal panacea," for there is scarcely a disease for whose relief or cure some claim has not been advanced for antipyrin. In 1887, Dr. Gonner (*Correspondenzblatt für Schweizer Aerzte*, No. 19, 1887) first suggested the use of antipyrin in diabetes, and his experiments have been followed up by Dr. Huchard, Robin, Germain Sée, and Panas. On the 13th of February, 1888, Dr. Huchard called attention before the Société Médico-Pratique de Paris to the marked effects which he had obtained from antipyrin in the treatment of polyuria and diabetes mellitus. One month later (*Revue Générale de Clinique et de Thérapeutique*, No. 7, 1888) he returned to this subject in reporting a case of diabetes insipidus in which the regular employment of this medication had reduced the daily amount of urine from twenty-four to three litres; at the same time referring to an observation on a diabetic patient in whom the enormous quantity of seven hundred and fifty-three grammes of sugar evacuated daily was in a few days reduced to two hundred and

* "A System of Obstetrics," p. 171. Philadelphia, 1866.

† *Lehrbuch d. Geburtshülfe*, p. 684. Leipsic, 1889.

seventy-one grammes, the urea being reduced from ninety-six to twenty-six grammes. Dr. Huchard was lead to the employment of this drug from its marked action on other neuroses of medullary origin, and he recognizes that all cases of diabetes are not amenable to this treatment. These results of Dr. Huchard attracted little attention until recently, when the entire session of the Academie de Médecine, April 9, 1889, was devoted to the discussion of this subject.

M. Panas (*Le Progrès Médical*, April 13, 1889) reported that he experimented on two cases of diabetes, and that they appeared to show in the most incontestable manner the power possessed by antipyrin for reducing the excretion of sugar. 3 grammes (45 grains) only of the remedy caused the entire disappearance of sugar from the urine; while glycosuria appeared as soon as its administration was ceased or the dose was diminished. According to Panas, the use of antipyrin will permit the employment of moderate quantities of starchy food, and has, in his hands, succeeded, even when absolute diet and various other remedies had failed to reduce the quantity of sugar.

Germain Sée stated that he could report eighteen similar observations in which antipyrin even served to completely suppress the excretion of sugar, at the same time reducing the quantity of urine, even when the starchy diet was persisted in. If, however, more than one hundred grammes, or one hundred and fifty grammes, of sugar per litre were excreted, or if the patients were phthisical, antipyrin proved inactive.

Dujardin-Beaumetz stated that more than a year ago he had recognized the value of antipyrin, and that all the substances belonging to the same series as antipyrin possessed likewise antiglycogenic properties.

Robin, on the other hand (*Gazette Médicale de Paris*, April 13, 1889, and April 20, 1889), is more guarded in his conclusions. He writes that, since October, 1887, he has treated a large number of cases of diabetes with antipyrin, of which four are published *in extenso*, and he concludes that antipyrin is a remedy which, while energetically reducing glycosuria, has, in his experience, never cured a case of diabetes. Nevertheless, while a cure has not been produced, it has reduced secretion of sugar and the thirst in polyuria, with improvement of the general condition of the patient. He has tested its use in various doses; 75 grains he has found to be too much, as it rapidly diminishes the appetite and is liable to produce serious albuminuria. With 60 grains the results are somewhat more satisfactory, although 45 grains is the better dose, except when the case is complicated by albuminuria, in which case he has found that 30 grains may be administered with some advantage, without increasing the amount of albumen eliminated. He recommends its combination with bicarbonate of sodium in the proportion of 1 part of the bicarbonate to 2 parts of antipyrin. Dr. Robin cautions against the habitual use of this remedy, stating that its use should not be employed in more than eight to ten doses, otherwise albuminuria may be produced, and so add a new drain on the already enfeebled nutritive process of the patient. The administration of antipyrin should thus be suppressed as soon as the excretion of urine reveals the least trace of albumen. In spite of this warning, Dr. Robin, nevertheless, believes that in albuminuric diabetes the dose of 30 grains of antipyrin may be employed without danger. Dr. Robin finally formulates his therapeutic conclusions as to the cases in which the employment of antipyrin is advisable somewhat as follows: Given a patient who is daily passing a large quantity of urine and large amounts of sugar, it is evident that with strict diet the glycosuria may be reduced, but this requires time, and is a great demand on the energy of the patient. In such cases it is highly advantageous to commence treatment by administering antipyrin for about a week without restricting the diet. The sugar, then, being considerably reduced, the patient may be submitted to a regular antidiabetic diet, which, if it at any rate does not further decrease the sugar, will at least serve to keep the state of affairs stationary. Again, when the diabetic patient, wearying of his monotonous fare, demands some relaxation of his diet rules, after the release antipyrin may again be administered for a week with advantage. It would thus appear that at the outset of treatment in case of diabetes mellitus, antipyrin will rapidly, though temporarily, reduce glycosuria and polyuria. It will permit through its employment relaxation of diet rules, and, by an alternative combination of the use of antipyrin and diet, the best attainable results of treatment in this disease are reached. If antipyrin does not at once produce reduction in the amount of sugar, it is useless to continue its employment; while, if the appetite diminish, feebleness, paleness, puffing of the eyelids, or sensation of tension in the face appear, all these are symptoms

which demonstrate that the use of antipyrin is more harmful than valuable. Dr. Worms, on the other hand, thinks that no more improvement will follow the use of antipyrin in diabetes than from a large number of other remedies, or even any change of treatment. Thus, he claims that quinine has been found quite as effective. Arsenic will succeed better and may be longer tolerated, and so will opium, valerian, and potassium bromide.

Finally, Dr. Kibbe, in the *New Orleans Medical and Surgical Journal* for May, 1889, reports a marked case of diabetes insipidus in which there was great reduction in the quantity of urine eliminated by the administration of antipyrin. 10-grain doses of this remedy were given every twenty-four hours, and the condition of improvement, which was very immediate, was maintained for over six weeks, when it is stated that the patient died from rapidly fatal diarrhœa.

SIMULO AS A REMEDY IN EPILEPSY.

IN the THERAPEUTIC GAZETTE for October 15, 1888, we published notes of the results obtained by Dr. Eulenburg through the use of simulo in cases of epilepsy, referring to the observations published in a previous number by Dr. W. Hale White on the same subject. In the *Medical Record* for May 11, 1889, Dr. M. Allen Starr publishes the report of seven cases, which, in the main, confirm the result of the other observers. He has found that the tincture of simulo has no effect upon the attacks of hystero-epilepsy or upon the hysterical state, nor does it modify the frequency and severity of attacks of petit mal or of procursive epilepsy. He finds, however, that it has some effect in modifying the frequency and severity of attacks of grand mal, but it is in this respect inferior to the bromides. About the only field of usefulness, therefore, for simulo would appear to be when for any reason it is deemed necessary to temporarily suspend the use of the bromides. No ill effects have been found by Dr. Starr to follow the use of the drug; no change in the rate or character of the pulse or respiration, no dilatation or contraction of the pupils, no muscular weakness, no mental depression or excitement, and no disturbance of the digestion in the doses in which it was used. We may repeat that the tincture employed is from the seed of the simulo plant (*Capparis corriacea*). The fruit, resembling a cherry, is about half an inch in length; the skin tough and brown; the body softer and green, and surrounding an almond-shaped pit with a white kernel. The kernel has a bitter taste, and it is from this that the tincture is made.

No attempt has yet been made to isolate its active principle, and it is possible that since practical experience proves that the use of this drug is not entirely without value in the treatment of epilepsy, that more encouraging results may follow the employment of its active principle should such a body ever be successfully isolated.

In the discussion which the reading of this paper evoked at the recent meeting of the New York Academy of Medicine, Dr. E. D. Fisher stated that while he had had no practical experience with the drug, simulo seemed worthy of a further trial, especially when combined with the bromides, although it appears that the effect of this combination had not yet been tested. Dr. L. C. Gray was rather inclined to believe simulo useless in epilepsy, since he tried it in several cases, both alone and in combination, and he had obtained from it no results except such as one could get in almost any case of epilepsy by changing the drugs employed. This was merely a temporary effect, and the same could be obtained by any one of almost a hundred other agents. He had, therefore, discontinued the employment of simulo, as it had, in his hands, proved so nearly useless as not to afford sufficient encouragement to give it a more extended trial.

PYRODIN AND HYDRACETIN.

AT the meeting of the Berliner Medicinische Gesellschaft, held May 1, 1889, Dr. Guttmann (*Prager Medicinische Wochenschrift*, May 8, 1889) reported some experiments made with hydracetin, the active principle of pyrodin or acetyphenilhydracin, the hydracetin being itself five times more active than pyrodin. It occurs in the form of a white, odorless, and almost tasteless powder, which is soluble in fifty parts of water, much more soluble in alcohol. Experiments on animals have shown that even in small doses this substance possesses marked toxic properties; 7½ grains introduced into the stomach or abdominal cavity of rabbits produce death within one day. Post-mortem examination shows that the inferior vena cava is filled with brownish-red blood; while the bladder is filled with a dirty, brownish-red fluid, which assumes a greenish-blue color with tincture of guaia

thus indicating abundant presence of the coloring-matter of the blood. The red blood-corpuscles have entirely disappeared; while sections of the kidney treated with hæmatoxylin show an enormous amount of detritus of blood-corpuscles in both the renal blood-vessels and urinary canals. Hydracetin, therefore, is a rapid reducing agent. Dr. Guttmann has employed it in cases of typhoid fever, pneumonia, phthisis, scarlatina, erysipelas, acute miliary tuberculosis, septæmia, and his experiments showed that hydracetin is a powerful antithermic. Administered in doses of 1½ to 2½ grains daily it produces within two or three hours a reduction of temperature of from 1½° to 2°, and in some instances even 3°. This reduction of temperature is, however, only transient, and after four or five hours the original temperature is regained. Hydracetin likewise produces diminution in the frequency of the pulse and respiration, with production of profuse secretion of sweat. Like other antithermic remedies, hydracetin controls the pains of acute rheumatism, but its action is only palliative and not curative, since it does not prevent relapse or extension of the disease to other articulations. Given, however, in the dose of 1½ grains daily in divided doses it causes remission of the pains for several hours. This analgesic action is explained by the fact that hydracetin is a reducing substance, belonging to the same class as pyrogallic acid. Employed in the form of an ointment of ten per cent. of hydracetin favorable action is produced in psoriasis; while it is also useful as an analgesic in cases of sciatica. Dr. Guttmann concludes that hydracetin may be freely used as an external application; while great care must be observed in its internal administration, since in three cases in which only 3 to 4 grains were given great paleness of the face was produced as an indication of the dissolution of the blood. As a consequence, he recommends that not more than 1½ grains should be given for a single dose, or, preferably, that only ¾ of a grain should be given at intervals of an hour. Even then the treatment should not be continued for more than three days.

At the meeting of the Société de Biologie, held May 4, 1889, Dr. Georges Lemoine (*Le Bulletin Médical*, May 8, 1889) likewise reported a number of researches made with this substance, employing, however, pyrodin instead of hydracetin, its active principle. He states that this substance (pyrodin) is a powerful antithermic, and gives better results than may be obtained from other remedies of the same class. He has employed it in tuberculosis, especially to combat the fever which accompanies the formation of pneumonic deposits. In doses of ¾ of a grain, pyrodin rapidly reduces temperature within an hour from 1° to 2½°, and it is necessary, to maintain this result, only to give this dose once daily to tuberculous patients. He even claims that this favorable action persists for many days, even after the administration of pyrodin has been suspended, and that it is only gradually at the end of from four to six days that the temperature regains its original height; sometimes it is asserted that this amelioration persists still longer. Besides this antithermic action, pyrodin is claimed to possess marked analgesic properties, and may be used with advantage in neuralgia, gastric pains, and the pains in the shoulders which are so frequent in tubercular cases. It is, moreover, stated that from its use night-sweats are relieved, and sleep becomes calm and more prolonged; in larger doses, pyrodin is toxic, and Dr. Lemoine advises that the dose given in one day should never exceed 1½ to 2½ grains; with 4 grains symptoms of poisoning are produced which resemble those occasioned by antifebrin,—cyanosis of the face and extremities, chills, reduction of the temperature, abundant sweats, acceleration, then slowing, and finally almost complete arrest, of the pulse and respiration, with final collapse, from which the patient may be rescued only with great difficulty. Certain cases have been found by Dr. Lemoine to be especially susceptible to pyrodin, and it should, therefore, never be employed unless carefully watched.

FREEZING OF THE SURFACE IN NEURALGIA.

IN a recent brochure, M. D. Debove, of the Hospital Andral, gives his experience with the therapeutic use of the chloride of methyl as a freezing agent in various diseases. He believes that the freezing acts somewhat after the manner of a counter-irritant. According to his experience, if the whole surface of the skin supplied by the sciatic nerve be very rapidly and superficially frozen, the results are almost miraculous, even in the most inveterate cases, the pain and the loss of power in the affected limb disappearing. In most instances repeated freezings are necessary for a complete cure; but usually after

three, four, or five applications a very pronounced effect is noted, even in the worst cases. In using the chloride of methyl it is essential that the territory frozen be widespread, and that the freezing be but momentary, since a persistent and very energetic freezing is liable to be followed by vesication or even sloughing. The effort is to act simply upon the surface of the skin. In females, according to the experience of Debove, vesication is especially easily provoked. Diabetes and albuminuria are considered by our author as contraindications to the use of the method.

M. Debove has also employed freezing in cases of facial neuralgia, and affirms that he has obtained a cure even in some cases in which the nerve had previously been cut by the surgeon, but in which, after four or five months, the pain had come back. In these cases it is often necessary that the freezing be performed daily for a long time, even for three months or more. Pigmentation of the skin is not rarely produced in sciatica, but the discoloration is asserted not to appear upon the face.

In Philadelphia, at least, freezing of the surface is not a new treatment in cases of rebellious neuralgia, as we have known the successful treatment of such cases in this manner. The first publication of the method, however, appears to remain with Debove, as he communicated his results as long ago as August, 1884, to one of the Parisian medical societies.

INHALATIONS OF CHLOROFORM IN DISEASES OF THE LUNGS AND HEART.

DR. M. ROSENBACH recommends inhalations of chloroform in small doses as a substitute for the too tardy or too prolonged action of narcotics, such as chloral, morphine, etc. (*Revue Générale de Clinique et de Thérapeutique*, April 25, 1889). Thus, when a patient is attacked with a paroxysm of pain, dyspnœa, or cough, which may last a quarter of an hour or half an hour, neither chloral nor morphine administered internally will suffice to produce relief, for before the medicine will produce its physiological action the crisis may have passed. On the other hand, a subcutaneous injection may, to be sure, produce an immediate action, but its effects are more prolonged than are required by the necessities of the case. In such cases the author recommends the inhalations of chloroform on account of the facility of adjusting the doses and in the possibility of producing a rapid action. Even the patient alone may regulate the dose, and in such cases as angina pectoris may produce relief without having to wait for the arrival of the physician. So also inhalations of chloroform, according to the author, may be used in asthmatic attacks of whatever nature, in dyspnœa in disease of the heart and lungs, in emphysema, in cardiac asthma, and in phthisical patients, where chloroform is much preferable to morphine in arresting irritable cough. Dyspnœa, due to pulmonary œdema, is not shortened by these inhalations, a fact which is not surprising when one recollects the marvellous action of injections of morphine in pulmonary œdema, in Bright's disease, and uræmic convulsions. Dr. Rosenbach likewise insists upon the palliative action of chloroform, or rather chloroform-water, as a local application in tuberculosis of the larynx.

Whilst abstracting and calling attention to the paper of Dr. Rosenbach, the editors of the THERAPEUTIC GAZETTE feel that they must give utterance to their belief that the practice discussed, especially the practice of allowing patients to give themselves chloroform, is an exceedingly dangerous one. One of the editors has had two personal friends, physicians, who have been found dead with a chloroform bottle by them under such circumstances as to demonstrate that the death was accidental and not intended. In angina pectoris the inhalations of nitrate of amyl are, we believe, much more efficient and much safer than those of chloroform.

In this connection we may call attention to a paper published by Dr. Stepp in the *Wiener Medizinische Blätter*, No. 9, 1889, in which the internal administration of chloroform is recommended in various affections. Dr. Stepp bases his views as to the administration of chloroform on the results obtained some time ago by Salowski, who found that the addition of a few drops of chloroform prevented putrefaction in readily decomposable fluids, and that cholera cultures, mixed with an equal quantity of chloroform-water, were entirely disinfected after one minute. This suggests the possible value of chloroform-water administered internally in cholera. Dr. Stepp found that an extremely favorable result followed the administration of chloroform-water in cases of gastric ulcer, the gastric pain ceasing and the vomiting being arrested; the results being attributed by the author to the disinfectant, astringent, and anti-hemorrhagic properties of the chloroform. In dyspnœa the chloroform-water internally was wit[illegible]

value. He, however, refers to six severe cases of typhoid fever in which the internal administration of chloroform was followed by the happiest results. Sixteen minims were dissolved in five ounces of water, and this given in three parts every day; its administration being followed in a few days by a great reduction of temperature and disappearance of all typhoid symptoms. It is claimed that in this dose chloroform does not act as a sedative, but as a stimulant.

LIABILITY TO DAMAGES FROM DEFECTIVE DRAINAGE.

IF the city authorities allow a sidewalk to be in such a condition that the passer-by falls and receives bodily harm, such passer-by readily obtains through the courts pecuniary recompense. If a landlord permits, even through ignorance, a weak cellar-door to remain, and the occupant of the house or a child in the street is injured in consequence, the landlord is liable for damages. But the more deadly results of bad drainage, or other sanitary neglect, in city or in house, have not commonly been thought to give good claims for money payment, probably because it has been less easy to demonstrate that the unsanitary conditions are the cause of the consequent illness. It would appear, however, that civilization is progressing, for we notice in the *British Medical Journal* of April 20 that a Mr. Charsley has recovered damages on account of typhoid fever, alleged to have been produced by the defective drainage of the house which he, Charsley, had rented of one Mr. Jones. The judge even went so far in this case as to state that "it seemed to him that the defendant honestly believed that the house was in fit condition for habitation, but that was not the question. If the jury thought that the house was not fit for human habitation, the plaintiff was entitled to damages."

Reports on Therapeutic Progress.

THE PLACE OF ELECTRICITY IN THERAPEUTICS.

The meeting of the New York Academy of Medicine held on March 21, 1889, was devoted to the different phases of the "Place of Electricity in Therapeutics," the subject being discussed by several members, from whose remarks we abstract the more important points as reported by the *Medical Record* for April 6, 1889. First, DR. M. ALLEN STARR read a paper on the "Physics and Physical Action of Electricity," concluding his remarks with the following statements: 1. Static electricity offered nothing more than the interrupted galvanic current, and failed to furnish those effects which were most desirable in the treatment of disease. 2. The constant galvanic current could produce chemical changes which aided nutrition or destroyed tissue according to the strength employed. 3. The constant galvanic current could transfer medicines into the body from without. 4. The interrupted galvanic current or faradic current could excite various organs to functional activity. 5. It was questionable whether the pathological state causing organic diseases could be in any way influenced by electricity. 6. If functional diseases were benefited, it was in an uncertain manner, and the physiological indications for the agent were as yet uncertain. As a therapeutic agent its use was somewhat limited, and careful observation and analysis were required to establish its sphere.

After the constant use of electrical treatment for the past ten years, the author said he had been disappointed in the results obtained, and he could not ascribe this to any defect in application, as he used the best method with careful measurements.

DR. L. C. GRAY then read a paper entitled the "Effects of Electricity on Central Nervous Diseases." First, however, he made some remarks on the paper of Dr. Starr, which, he said, contained some statements which had rather startled him. He would reply to the question, Could electricity be given as definitely for a definite purpose as opium? in the affirmative. There were certain affections which he would undertake to relieve with electricity with as much certainty as other affections with opium or quinine. Neither opium nor quinine was infallible, nor was electricity. He would undertake by electricity to relieve certain neuroses, and benefit as positively as any drug could do certain symptoms in cerebral disease, but not to cure the organic disease. He did not know that anything more positive could be said of the effects of opium or quinine, or any other drug. But there was a great deal in the way electricity was used, and at the opening of his paper he briefly stated the latest approved manner of using it.

The reader based his deductions regarding the value of electricity in therapeutics on six-

teen years' experience with it. For convenience he divided the diseases of the brain into the insanities and gross cerebral lesions. From the insanities he excluded in this connection the very chronic and incurable forms. But subacute mania, melancholia, the insanity of doubt, and functional insanities could all usually be benefited by electricity, but only in the period of convalescence, not in the acute stage.

Of the gross cerebral diseases it might be said that it was useless to administer electricity in brain tumors, meningitis of traumatic, epidemic, or aural origin, or in facial hemiatrophy. It was a useful adjuvant in intracranial syphilis in the early stage of headache and insomnia, and sometimes in the later stage following hemiplegia. Hemiplegia due to neoplasm and meningitis was omitted from treatable cases. If the molecular changes induced by chronic endarteriitis of middle age, or of nephritis, or by emboli were such as not to lead to a fatal issue in case of hemiplegia, they could usually be favorably influenced by electricity when the primary symptoms of shock had thoroughly passed off. Meningitis of traumatic origin, if slight, might be benefited by electricity, and if hemiplegia of vascular origin were not followed by contracture it could also usually be thus benefited. Tic douloureux was uncertain in its response to electricity.

Dr. Gray said he had no faith in static electricity. The two currents which would answer every purpose of the physician were the galvanic and faradic. Speaking in a general way, the insanities required only electrical treatment directed to the intracranial contents, and this was best done with the galvanic current. Gross cerebral diseases produce two classes of symptoms: those which were entirely cerebral, and those which were both cerebral and peripheral. In the former class galvanism addressed to the cranial contents would usually answer every purpose, while in the latter it might be better to address galvanism to the intracranial contents, and faradism to the affected peripheral structures. The method of applying the currents in the several cases was described.

He said the question as to which pole should be employed in the case of faradism, or as to whether an ascending or descending current should be used, had been a very puzzling one to him. He was perfectly well aware that there was a difference between the chemical effects of the negative and positive pole, that there was a physiological difference upon which had been based the prognostic use of electricity, and also that every patient could distinguish the positive from the negative pole by the sensation; yet, in spite of all these indubitable differences between the two poles, he had never been able to satisfy himself that there was a therapeutic difference between them. Reasoning from *a priori* considerations, the text-books told us that the positive pole was sedative and the negative pole stimulant, yet he had over and over again unavailingly endeavored to obtain indications for the use of the positive or negative pole in a given disease. The only rule which he could lay down was this: Where one pole did not agree, try the other; and if that did not agree, stop using electricity.

Dr. W. R. Birdsall read a paper on the "Effects of Electricity on Spinal-Cord Diseases." He admitted as truthful the doleful picture of the therapeutic effects of electricity in spinal-cord diseases, which Dr. Starr had drawn, only in so far as it applied to other remedies as well. Too much should not be expected of this agent in a class of diseases which were incurable. Like Dr. Starr, he had never seen a case of organic disease of the spinal cord cured by electricity; but he went further, and stated that he had never seen such a case cured by any single therapeutic agent whatever. But for the relief of symptoms he had seen electricity serve a more useful purpose than any other. And, as a rule, in this class of affections we attempted only to follow symptomatic indications, as the relief of pain, anæsthesia, spasm, paralysis, trophic changes, symptoms which were the result of a variety of diseases of the spinal cord and its membranes. It might be laid down as a rule that in acute inflammatory affections of the cord electricity was not beneficial, and might prove injurious. Its use should be restricted to non-inflammatory affections. This led to the question, What were the effects produced by electricity? It was essentially a stimulant, an exciter of living tissues.

In therapeutic application we could not expect to find the distinctive effects of the cathode and anode as observed when electricity was applied to an isolated nerve. We did, however, know the effects of these agents on nerve-tissue, even more definitely, he thought, than we knew the effects of drugs. He believed a large part of the beneficial effects of electricity were indirect or reflex. The very fact that one could produce a stron muscular contraction, or sensory impressio

by static electricity showed that it was an agent of decided force. In this connection the question of influencing the spinal cord or deeper structures naturally arose. He agreed with Dr. Starr that, by the ordinary method of applying the electrode to the back, a very feeble impulse was obtained in the cord, yet he believed that the cord could be excited in that way. All the tissues between the two electrodes which had a resistance not greater than that which the electro-motor force would overcome transmitted the current according to the ratios of their resistance. He believed, however, that the main benefit obtained from electricity in spinal-cord diseases was due to the peripheral impression.

The chief benefit which he had observed was in enabling the patient to recover more rapidly from partial paralysis than he would without electricity. Also in infantile paralysis improvement had taken place under galvanism in cases which had previously been at a stand-still. Paralysis from myelitis, also facial paralysis and lead palsy, had improved under electricity, chiefly galvanism.

Dr. A. D. Rockwell then read a paper on the "Effects of Electricity in Peripheral Nerve-Lesions." The cases considered were those of functional troubles, among the more important of which was facial paralysis. He had seen many such cases hastened towards a cure by electrical treatment. In illustration of the form of current called for in given cases, he cited one in which the physician who first saw the patient, suffering from facial paralysis, applied faradic electricity without appreciable benefit. When brought to Dr. Rockwell, he made use of galvanism, and the patient recovered. Here the intramuscular nerves were paralyzed in the beginning and failed to react to faradism, while the muscular fibres being still intact, they responded to galvanism. Faradism exerted its greatest influence upon the intramuscular nerves, and galvanism upon the muscular fibres. Dr. Rockwell had obtained much benefit from electricity in diphtheritic paralysis.

Dr. E. D. Fisher read a paper on the "Effects of Electricity in Functional Nerve-Affections." The reader alluded briefly to the theory of the action of the agent in these cases, but said he quite agreed with Erb, who had expressed the view that we might as well do away with the bromides and arsenic in functional nervous diseases because we did not understand the theory of their action as to abandon electricity because of our ignorance of the laws underlying its influence. Undoubtedly galvanism was more important as a remedial agent in functional nervous diseases than was static or faradic electricity; yet, with regard to static electricity, he would say that in his opinion it should not be so positively discarded as it had been by Dr. Starr. Especially in neurasthenic cases did it have a stimulating and pleasing effect. It was in functional diseases, with error in nutrition, and not organic troubles, that static electricity found its field of usefulness.

SUSPENSION IN THE TREATMENT OF PROGRESSIVE LOCOMOTOR ATAXY.

Professor Charcot recently gave a clinical lecture on vertical suspension of the body in the treatment of progressive locomotor ataxy and some other diseases of the nervous system. This novel method of treating tabes dorsalis was first initiated by Dr. Motchoukowsky, of Odessa, who published a *brochure* on the subject in 1883; but it received no attention in Western Europe till 1888, when Professor Raymond, of Paris, while on a scientific mission in Russia, was struck with the results presented to him. Dr. Ouanoff, his fellow-traveller (a pupil of the Salpêtrière clinic), showed its practical application there. In Motchoukowsky's pamphlet considerable improvement was ascribed to it in twelve tabetic persons; also in various neurasthenias, independent of tabes, in which the sexual functions were re-established by this treatment. The patient is suspended for about three minutes by a Sayre's apparatus, and the arms of the patient while suspended are raised every fifteen or twenty seconds to increase the traction on the spinal column.

Charcot's tabetic patients numbered eighteen, with four hundred *séances*. Of these, four were only suspended each three times; the rest went on regularly. Of these Professor Charcot says, "The remaining fourteen have experienced in varying degrees an improvement, which in eight has been quite remarkable." All were pronounced tabetics. Walking is improved to begin with; the patients say they can walk better after the first suspension. This improvement at first lasts only a few hours, but after eight or ten sittings persists. After twenty or thirty sittings Romberg's sign disappears. Then vesical troubles are lessened or removed; also the lightning pains. Sexual impotence gives place to sexual desires and erections. (Experiments by Dr. Ouanoff on healthy persons

have shown that this method has an exaggerating effect on virility.) The cotton-wool feeling in the feet gives way more or less to healthy sensations, and in general the whole health improves. Every patient steadily improved, with one exception, a young tabetic, aged 32, who at first improved, then fell off, then again improved somewhat. But the knee-jerks have not reappeared in any of the patients after three months' treatment, nor are the pupillary symptoms altered. As to other diseases, a young female with Friedreich's disease was greatly improved by the treatment. In two neurasthenic and impotent patients the sexual functions were re-established. But a patient with disseminated sclerosis was made worse, for, after two sittings, a spasmodic paraplegia appeared, which, however, gave way in three days. Further trial of this method is required before an opinion of its value can be given. The results are most encouraging so far, and at any rate perfectly harmless.

After the favorable report of Professor Charcot on this treatment requests were daily received at the Salpêtrière for an account of its practical application. In answer to these, Dr. Gilles de la Tourette has written the article of which this is an abstract, and begins by reminding us that the treatment was first tried in 1883, by Dr. Motchoukowsky, of Odessa. The author has superintended about eight hundred suspensions of forty patients. The suspension is easily effected when conducted in the proper way, but that way must be known. Sayre's apparatus is the one made use of (no corset is required), and its construction is well known. The weight of the body is borne partly by padded broad straps, beneath the chin and occiput, forming one piece, and partly by two separate shoulder-straps. The rings supporting the head-straps are capable of adjustment, and the fixation of the apparatus generally requires great care. The size and shape of the patient's head must be taken into account, and soft pads may be interposed, where necessary. The length of the shoulder-straps is a most important consideration. If too long, the brachial plexus is compressed, and tingling and pain in the arm is set up; if too short, on the other hand, the muscles of the neck are stretched to an intolerable degree. Two or three trials have to be made before the exact disposition of each strap and ring for a particular patient is known. The operator then very quietly raises the patient from the ground, by the pulley, just far enough to prevent the extended toes from touching the floor; he is then steadied to prevent oscillation, and the operator fixes his eyes on a second's watch to determine accurately the duration of the *séance*. While the patient is thus suspended, he is directed to raise his arms gently from time to time; if this can be done it renders the suspension and traction more efficient. The average time of suspension is three minutes, and it ought in no case to exceed four. At first, indeed, half a minute is enough, and the time is gradually prolonged at each subsequent sitting, till, after the sixth or eighth, the period of three minutes is attained. Even here, individual susceptibilities must be taken into account,—*e.g.*, a heavy patient will not bear a long suspension so well as a lighter one. When the operation has been well conducted, no painful traction of the neck-muscles is felt next day. Neither pain nor even fatigue should be occasioned.

Daily "sittings" are harmful; every other day is quite often enough. The patient must be let down with extreme gentleness, and not by a succession of shocks. He should be supported while being relieved of the apparatus, and should afterwards rest a short time in an arm-chair placed ready. The patient's costume is not important. He should take off his coat before the suspension, and his neck should be bare, or at any rate not compressed. The traction by the operator should, of course, be made from the upper pulley, not the lower, if the portable tripod suspension apparatus is used. But this tripod is not the best arrangement here, though very convenient in applying a plaster-jacket; for the patients may grasp one or other leg of the tripod with convulsive force when they find themselves off the ground, and may even overturn the apparatus. As to the duration of the treatment, this is a point not yet settled. Patients who began it four months ago at the Salpêtrière are still attending there for it, and appear to improve steadily (*et semblent s'améliorer d'une façon progressive*). In any case, as Professor Charcot says, the treatment may be boldly tried with perfect confidence as to its harmlessness when the proper procedure is adopted.—*London Medical Recorder*, March 20, 1889.

SULPHONAL IN NIGHT-SWEATS.

In addition to the hypnotic properties enjoyed by sulphonal, this drug is capable, according to Dr. Böttrich, of Hagen, W—

phalia, of exercising a most beneficial influence in night-sweats. It acts, he thinks, very similarly to atropine, but, unlike it, it is quite free from any undesirable effects. He found this property out by accident, having prescribed a ¼ of a gramme (nearly 4 grains) for an old lady of 80 as a sleeping powder. The patient had been suffering from the most profuse night-sweats, obliging her to change her things twice during the same night. After the first dose she asked the doctor whether he had not put something into the powder to prevent the sweats. On making further observations, Dr. Böttrich was able to convince himself that, as a rule, ½ gramme (7½ grains) of sulphonal will stop night-sweats. Its effects seem, fortunately, to be somewhat permanent, as even after the drug has been stopped the night-sweats are found to be much less severe than they were previously to taking it.—*Lancet*, April 27, 1889.

THE ACTION OF SULPHONAL IN INSANITY.

Dr. Wm. Mabon publishes in the *American Journal of Insanity* for April, 1889, reports of eighteen cases of various forms of insanity in which sulphonal was administered as a hypnotic, being given one hundred and nineteen times on one hundred and fourteen different nights. It was employed twenty-six times in doses of 15 grains; eighty-one times in doses of 30 grains; nine times in doses of 45 grains; three times in 60-grain doses. On eighty-three nights sleep was produced, which continued six hours or more; on twenty nights, from three to six hours; and on eleven nights, less than three hours. The sleep produced was natural on ninety-seven nights, and restless and broken on seventeen. The time required to produce sleep was, on the average, one hour and a quarter. The only unpleasant after-effect noted was slight somnolence in two or three instances. With the later administration of the drug in these same cases this symptom was not persistent. In regard to the dosage, the facts brought out by these observations seem to indicate that not much can be expected from 15-grain doses in the class of cases in which the trials were made. Generally 30 grains will be found sufficient to bring about a quiet and refreshing sleep. As to the method of administration, in the early trials sulphonal was given suspended in mucilage, but later in hot milk and hot [illegible]el. The principal advantage of using the latter menstrua was the increased promptness of action. (In one instance there was a difference of an hour between the two methods.) During the period of these experiments comparisons were made with other hypnotics, and the conclusions arrived at were that in the majority of cases the sleep produced by sulphonal was the most satisfactory; it was calmer, continued longer, and was more refreshing than that produced by any other hypnotic. Among the advantages that sulphonal possesses over other sleep-producing remedies may be mentioned the absence, after its use, of disturbances of digestion, secretion, circulation, and respiration; its easiness of administration, its tastelessness, its lack of odor, and, finally, the important fact, that the resulting sleep closely approximates in quantity and quality that of nature.

Since the foregoing observations were recorded it is stated the use of sulphonal has been continued by the writer with similarly satisfactory results.

THE TREATMENT OF BURNS PRODUCED THROUGH SULPHURIC ACID.

The deep alterations and destruction of tissue which are produced from the contact of sulphuric acid with the skin are attributable to the great affinity which the sulphuric acid possesses for water, so that burns produced by sulphuric acid are not burns in the strict sense of the word, but should be more correctly described as violent dehydration. The indications, naturally, for the treatment of such burns are to rapidly dilute and neutralize the acid as soon as possible. In a paper on this subject by Ribaud, referred to in the *Centralblatt für Klinische Medizin* for April 13, 1889, objection is taken to the ordinary application of alkalies and oils to such burns. It is true that magnesia neutralizes the acid, but does not unite rapidly enough with the sulphuric acid which has penetrated into the deeper parts of the wound; while in addition magnesia yields no water to the sulphuric acid. The treatment with oils is still more objectionable, since a degree of heat is produced by their action, which almost approaches the boiling-point. The treatment with alkaline waters is in all respects preferable, and if alkaline waters are not at hand in sufficient quantity, the employment of very large amounts of fresh water, immediately after the accident, forms the best and most ready treatment. The author states that the finger may be held

for two and a half minutes in pure sulphuric acid, and then, if immediately washed off with large amounts of water, will be free from any burn. A longer immersion than this will, however, in all cases produce a burn.

THE TREATMENT OF ACNE WITHOUT ARSENIC, SULPHUR, OINTMENTS, OR LOTIONS.

At a meeting of the Medical Society of the County of New York, held April 22, 1889, Dr. Geo. H. Fox read a paper with the above title (*Medical Record*, May 4, 1889). He said it might be inferred from the title of his paper that he objected to the use of arsenic, sulphur, ointments, or lotions in the treatment of acne, but such was not the truth. These time-honored remedies were doubtless valuable, yet their usefulness was limited, and their routine employment was what he objected to. Some cases of acne could be cured by local treatment alone, but the majority of cases demanded general treatment; that is, the treatment of the patient, and not merely of the patient's skin. In the general treatment the administration of medicines might sometimes play an important part, but the profession had yet to learn that diet and hygienic rules were worth more than all the drugs of the Pharmacopœia. From the stand-point of the therapeutist the best division of acne was into the irritable and the indolent forms of the disease. The practical value of such a division had long been appreciated in the treatment of ulcers. The irritable form was largely reflex in origin, and was greatly affected by disturbances in the alimentary tract and of menstruation. The skin was usually fine and soft, quickly inflamed by stimulating applications, and the use of the watch-key, with which to press out the comedones, was apt to cause raised red spots. Local treatment in these cases, except of the most soothing character, was contraindicated; general treatment was most efficacious. In the indolent form the vascular excitability just mentioned was comparatively slight, while the glandular obstruction was the most important feature. The skin was likely to be coarse and doughy, often greasy. The accumulation of the foreign bodies in the skin led to the formation of the papules and pustules, and in strumous patients to abscesses. In these cases the glands should be evacuated; the skin, in other words, thoroughly cleansed. Soap and water and ointments did not answer.

Bearing in mind that the irritable form required general treatment, and the indolent form local treatment, it would be found that in the former physicians relied more upon arsenic than upon any other remedy; but he thought that if arsenic were banished from the globe the average physician would be far more successful in the treatment of acneous affections. Sulphide of calcium had been recommended by some authorities, but he thought it was liable to lead one using it to neglect more important measures. Ergot possessed value which was not generally recognized. Its chief benefit was seen in indolent acne, and he had come to regard Dr. Denbow's explanation of its action as nearer correct than that which he had formerly offered. In the local treatment of irritable acne he had tried many remedies, but would simply say that at present he seldom found occasion for their use. The treatment of acne in general, which he had found of greatest benefit, was neither new nor original; it consisted in diet and local massage. Diet struck at the root of the disease. Local massage could be made with the fingers or instruments adapted to the purpose. Its object was twofold, to empty the glands and to cause the disappearance of the inflamed lesion. It required to be persisted in. Among the instruments to be used he now felt like apologizing for his former criticism of the circular curette. Trial had proved its value, and the redness which it left would disappear in due time. No fixed plan of treatment of acne would apply to all patients.

THE PURGATIVE EFFECTS OF GLYCERIN ENEMATA AND SUPPOSITORIES.

In the *Novosti Terapii*, No. 4, 1889, p. 49, Dr. F. F. Mīlëëff, of St. Petersburg, details his extensive experience concerning the use of small glycerin enemata and suppositories in habitual constipations of various kinds. The main results of his observations may be condensed as follows:

1. In those cases where accumulation of fæcal masses takes place in the lower portion of the large bowel, a rectal injection of 1 or 2 drachms of pure glycerin in an adult, and of ½ to 1 drachm in a child, is invariably followed by stools occurring in two or three minutes.

2. The fæcal masses do not show any signs of liquefaction or even softening; still, owing to lubricant properties of the dru- the act of defecation proves to be fairly ea and comfortable.

3. The enemata do not give rise to any slightest painful or unpleasant sensations about the rectum. Neither do any phenomena of rectal irritation supervene, even on a prolonged employment of the injections.

4. The purgative effects of glycerin should be attributed to its stimulating action on the nervous and muscular apparatus of the large bowel, which action is, probably, determined by the drug greedily extracting water from the intestinal mucous membranes with its nerve-fibres. The desiccation irritates the latter, and thus excites a reflex contraction of the intestinal muscular coat. The hypothesis finds a strong support in the fact that any dilution of glycerin with water markedly weakens its purgative action, and that the more in proportion the larger is the amount of water added.

5. Glycerin enemata are especially indicated (*a*) in the constipations of pregnancy, where ordinary water enemata are inconvenient on account of their considerable bulk, which causes discomfort to the woman; and (*b*) in infantile constipation caused by unduly prolonged feeding on milk alone, and associated with fæcal accumulations in, and consecutive distension of, the sigmoid bowel. In cases of the kind, glycerin enemata are very useful on account of their energetic action in the intestinal muscles, and convenient because of their small bulk.

6. As to glycerin suppositories (containing half a drachm of the drug each), they are said to act well (in five minutes or so) only in such cases where no pure glycerin enemata were previously employed, otherwise they remain inactive. Hence, Dr. Mīlēēff is accustomed to commence the glycerin treatment of constipation with suppositories (a piece at bedtime), and passes to enemata as soon as the former cease to secure the result desirable.

7. As regards the apparatus for the enemata, Dr. Mīlēēff thinks that any special contrivances are quite superfluous. At all events, he uses for the purpose an India-rubber urethral syringe with a piece of thick-walled elastic-tube on the nozzle.

[*Cf.* Dr. A. S. Polūbinsky's paper on the subject in the *London Medical Recorder*, March, 1889, p. 91. In the *Brit. Med. Jour.*, December 22, 1888, p. 1424, Dr. George Grewcock, of Brighton, says that he "found out quite accidentally a novel method of applying glycerin," which is "equally efficacious with the clyster. . . . If a piece of cotton-wool the size of a nut, is well saturated with glycerin, and inserted as a suppository, in a short time a copious motion is produced." Certainly it would be worth while to give a fair trial to the plan which makes superfluous any appliances, including Dr. Mīlēēff's urethral syringes.—REP.]—*London Medical Recorder*, April 20, 1889.

THE USE OF MENTHOL IN ASTHMA.

In the *Therapeutische Monatshefte* for April, 1889, DR. THEODORE JORES writes that since October of 1888 he has had a lady of 50 years of age under his treatment, in whom, in the summer of 1888, a number of polypous growths were removed from the nose. When the patient first came under his care she suffered from congestion of the head, associated with great difficulty of breathing, the attacks coming on usually every two days. Foot-baths, cathartics, and leechings over the mastoid processes of both sides brought some relief. The attacks of congestion gradually disappeared, while the asthma became more and more prominent. A number of remedies were employed in the treatment of this symptom, which were, however, generally without avail. Dr. Jores then made use of menthol in a twenty per cent. solution in olive oil, which was followed by the almost complete disappearance of all pulmonary symptoms. The drug was used as an inhalation and from its very first application, and in every instance served to relieve the asthmatic attacks.

THE TREATMENT OF WHOOPING-COUGH.

DR. TORDEUS, of the Hôpital St. Pierre, Brussels, in a clinical lecture on "Whooping-Cough," concludes with a few words as to the treatment he adopts. He has no faith at all in the administration of preparations of belladonna for the purpose of preventing the development of the disease; the only prophylactic measure which, in his opinion, is worthy of any reliance being the rigid isolation of the patients. He recommends that as soon as whooping-cough has broken out in a family all the other members who have not already had the disease should be sent away, especially those who may be weak, rickety, or very young, as such are predisposed to bronchitic and pulmonary inflammations. Before the children which have been sent away are allowed to return, a thorough process of disinfection should be carried out, not only of the room occupied by the patient, but of all ob-

jects with which he may have come in contact. This is to be effected by means of carbolic acid, chloride of zinc, the vapor of sulphur, boiling water, or the hot-air chamber, according to the nature of the things to be disinfected. As to medicine, during the early or catarrhal stage, ipecacuanha and bicarbonate of soda should be given, with the object of rendering the phlegm less thick and tenacious; afterwards, when the nature of the disorder has declared itself, germicides—as carbolic acid, salicylic acid, benzoic acid, sulphate of quinine, resorcine, etc.—should be prescribed. M. Tordeus especially recommends inhalations of a three to five per cent. solution of benzoate of soda, even in the case of very young children, though he does not specify the kind of apparatus he employs for this purpose. In order to moderate the violence of the attacks, bromide of potassium, oxide of zinc, belladonna, hyoscyamus, cocaine, antipyrin, or chloral may be given. As the disease is beginning to disappear, expectorants, such as chloride of ammonium, senega, and liquorice, are useful; and, finally, anæmia and debility during convalescence may be treated by country air, cod-liver oil, preparations of iron, quinine, and arsenic, and nourishing diet. Where symptoms of broncho-pneumonia show themselves, all depressing drugs must of course be avoided. In such cases M. Tordeus recommends wet packs and carbonate of ammonia, combined with alcohol.—*Lancet*, April 27, 1889.

SULPHATE OF CALCIUM AS A REMEDY FOR INFANTILE CONVULSIONS.

In the *Archives of Pediatrics* for May, 1889, MR. H. VALENTINE KNAGGS recommends the use of sulphate of calcium in the convulsions which often occur in children from dentition, falls on the head, meningitis, and often acute tuberculosis. The dose required is small; for infants under 6 months of age, a grain of the sulphate of calcium may be dissolved in half a pint of water, and a teaspoonful of the solution given hourly, when the dose may cautiously be increased if thought desirable. In children over 1 year of age less caution will be required. The dose will vary from $\frac{1}{8}$ to $\frac{1}{20}$ of a grain every hour, or less frequently, according to the severity of the case. The drug must be freshly prepared and active, as it soon loses its virtues and becomes inert. It may be mixed in powders with sugar of milk, and a packet of them enclosed in tinfoil. Mr. Knaggs likewise states that antipyrin may sometimes be alternated with the sulphate with advantage, although these two drugs appear to be antagonistic to one another. Thus, in infantile convulsions antipyrin, in doses of one-half to two grains, repeated frequently, will often aggravate convulsions; but if it should appear that the sulphate is exerting too depressing an effect on the nervous system, antipyrin alternated with it will serve by its stimulative action to counteract this effect.

THE USE OF SOLVENTS IN CASES OF RENAL CALCULUS.

It is well known that a patient who habitually passes brick-dust or uric acid deposit in his urine will, sooner or later, develop symptoms of gout or stone, and it is probable that sulphates of magnesium and sodium will frequently prevent this condition developing into the more serious forms. In the *Canadian Practitioner* for April 16, 1889, MR. ARTHUR JUKES JOHNSON publishes a paper in which he claims that when a calculus of small size, composed of uric acid, is formed or is forming in the pelvis of the kidney, through the use of alkalies, we may dissolve such a stone to such an extent as to allow of its easy passage down the ureter, to be followed by its easy expulsion from the bladder. The medicinal remedies at present generally used are: caustic potash, the bicarbonate, acetate, and tartrate of potassium. The less frequently used are soda and lithia in different forms. The reason why this alkaline treatment has in all ages been looked upon with favor is easily discovered if we look at the composition of calculi in general. Three-fifths of all the calculi which form in the kidney or bladder of adults are composed of uric acid or the urates. The other two-fifths, or nearly so, are phosphatic. In three or four per cent. the stone is formed of oxalate of lime, and in one in a great many hundred of cystine. The uric acid calculus is found in water abounding in acid, the excess of which is expressed by the stone. The phosphatic stone is the product of alkaline urine, generally ammoniacal, of which condition it is the result. The urates, oxalates, and a few of the phosphates are found in the kidney, and are the product of certain constitutional derangements above alluded to. The greater part of the phosphatic material, whether in mixed or in phosphatic stones, is produced solely in the bladder, and is the product n

so much of any constitutional state as of a local diseased condition. If we examine these calculi still further, we will find that a difference exists in their nuclei also. The nucleus of the oxalate of lime calculus consists, not of mucus or epithelium, as is generally the case in the phosphatic stone, but is of the same composition as the exterior. The little mass is seen under the microscope to consist of a number of dumb-bell crystals firmly attached to one another. Dr. Lionel Beale, more than twenty years ago, found these collections in the uriniferous tubes of kidneys obtained from post-mortems, as also in the kidney of a fœtus, and in the urine of a child 2 years old. When these little masses have reached a certain size they adhere to one another, producing the well-known mulberry calculus. The uric-acid calculus may be composed entirely of uric acid, but it will generally be found that the nucleus consists of a mass of dumb-bell crystals of oxalate of lime.

Now, experimentally we know that uric acid, when in a specimen of urine sent to us for examination, is easily dissolved by an alkaline solution, some alkalies having more power in this respect than others, and their resultant salts being more soluble. The urate of sodium is to a certain extent soluble, the urate of lime more so, the urate of potassium the most soluble. Therefore potash has for a very long time been considered the most powerful agent that could be used in cases of uric acid gravel, and is one that can be taken for a long time without producing any objectionable effects. The citrate of potassium seems generally to be the best form to give it in, except when, as Sir Henry Thompson points out, it exerts too much diuretic action; then the bicarbonate should be used. Care, however, should be taken in using the carbonate; for if the solution in which it is given be too strong, as Dr. Roberts found, the calculus becomes coated with an alkaline biurate, and is not dissolved. But the citrate and acetate, as we know, when given by the mouth, become carbonates in the urine; and although about six drachms a day may be given of either of these, they should be very largely diluted with water. If, therefore, a calculus has formed, or is forming, in the kidney, and we know from our chemical and microscopical examination of the water that it is composed wholly or in part of uric acid, the treatment, we are told, should be to give potash to dissolve as much of the stone as possible, and plenty of water to suspend and carry away the resultant. Although this has been recommended on the highest authority, it is a treatment that is very difficult to enforce, chiefly because many patients object to drinking the necessary amount of cold water, whereas we know that water alone is a very good solvent. Hence a course of Vichy water is frequently ordered in these cases. But Vichy owes its utility to the carbonate of sodium it contains, of which about forty-seven grains exist in every English pint. Of the natural mineral waters, many are of undoubted value, not only on account of the potash, lime, or soda that they contain, but because they are all more or less purgative, and so assist digestion and prevent further deposit.

The most efficacious seems to be that obtained from the Waukesha Spring, known formerly as "Bethesda," but latterly as "Glenn."

Mr. Johnson does not claim that this water will destroy a uric acid calculus in the kidney, though it certainly will do so when such a stone is put into a bottle of it. The method of treatment which Mr. Johnson at present recommends is to order the carbonate, or citrate of lithium, to be taken in a tumbler of Bethesda water three or four times daily. In a very few days the pain and other distressing symptoms abate, and in a short time there will be evidence of the passage of a small calculus down the ureter or through the urethra.

This treatment should be combined with a careful diet. Alcohols, sugars, and fatty substances should be avoided, and care should be taken not to catch cold. But no treatment can be satisfactory unless the exact location and composition of the stone is ascertained. For to treat a phosphatic stone, even in the bladder, as if it was composed of uric acid, would rather tend to increase, instead of diminish, its size. It is a matter of doubt whether any solvent taken by the mouth has much effect on a stone that has formed in the bladder, an operation being generally the best treatment under these circumstances. But even here much may be done by solvents, not administered by the mouth, but injected into the bladder. The stone in these cases is generally phosphatic, and the mucous membrane of the bladder more or less irritated. It is advisable to have the water drawn off twice a day, and the patient should be taught how to pass the catheter for himself. If this is done, he can carry out the further treatment also. This consists in washing out the bladder, after having used

the catheter, with a solution of ⅓ to ½ grain of acetate of lead to the ounce of water, or 1 to 3 drops of dilute hydrochloric acid to the same quantity. It is best done by putting the solution into a 4-ounce rubber bottle, with stop-cock, and injecting half the contents. This is then allowed to run away, when the balance of the fluid in the bottle should be thrown into the bladder and allowed to remain.

THE USE OF SULPHUR IN VARIOUS DISORDERS OF THE ALIMENTARY CANAL AND LIVER.

In the *Lancet* for April 6, 1889, SIR ALFRED B. GARROD states that for many years he has been accustomed to administer sulphur in very small doses for a length of time in the treatment of disorders of the alimentary canal and liver; also in certain diseases of the joints, especially rheumatoid arthritis, and chronic muscular rheumatism and skin diseases. The form in which he administers it is that of a lozenge which contains five grains of the milk of sulphur and one grain of cream of tartar. This lozenge is stated to be quite agreeable to the taste, and contains enough sulphur for therapeutic purposes. He claims that on the alimentary canal sulphur acts as a stimulant to the normal peristaltic movements, and in moderate doses becomes a laxative. It is probable that the stomach itself is little influenced by the sulphur, as the surface and contents of that organ are usually acid in reaction, and possess no solvent power; but when it arrives at the duodeum, and meets with a different condition of the mucous membrane and the presence of bile and pancreatic fluid, both alkaline in reaction, more or less of it becomes converted into a soluble sulphide, which is absorbed by the portal vessels, and passes first through the liver and afterwards into the general circulation by the hepatic vein. From the blood it afterwards becomes eliminated partly by the skin and partly by various mucous membranes. We have good evidence that it is thrown out by the skin in the fact that silver worn close to the surface becomes blackened to some degree when sulpur is taken continuously, and the odor of sulphuretted hydrogen can occasionally be detected in the breath. The presence of the cream of tartar in the lozenge helps to prevent the formation of any soluble sulphide in the stomach, and hence the absence of sulphurous eructations. Any soluble sulphur, however, which reaches the cæcum and colon, where the reaction is again acid, is apt to evolve hydrogen sulphide, and impart odor to the contents of the lower bowel.

As the alimentary canal is influenced partly by the direct action of the sulphur on its mucous membrane, partly by the circulation of the sulphuretted blood through the intestinal capillary system, and partly by the altered and increased flow of bile from the liver, it will be naturally expected that in morbid states of this canal we should be able to detect marked effects from the continued administration of the remedy.

Dr. Garrod finds that even this small quantity of sulphur usually produces appreciable laxative effects. He summarizes the results of his experience with sulphur as follows:

1. The results contained in the present communication were derived from the administration of very small doses of sulphur continued for a lengthened period of time, the doses being much smaller than those hitherto employed, often not exceeding five grains each day, and the time of exhibition much longer,—namely, weeks, months, and in some cases years. 2. A lozenge, named the Compound Sulphur Lozenge, containing five grains of sulphur and one of cream of tartar, was usually prescribed, as being very convenient and by no means unpleasant in taste; and it was found that patients could be readily induced to persevere in using them for an almost indefinite time. 3. The physiological effects of these minute doses of sulphur are observed upon the alimentary canal and the organs connected with it; also on the pulmonary mucous membrane and the skin. 4. Sulphur is not an element foreign to the system, as it is contained in the most important proximate principles of the blood and flesh, and likewise of the bile and saliva. 5. Sulphur given in the manner above described is of great value in many morbid states of the alimentary canal and liver, as in cases of hepatic sluggishness and in piles and hemorrhoidal hemorrhage; besides which the continued use of the lozenges is often quite effectual in obviating habitual constipation without producing the unpleasant action often pertaining to ordinary aperient medicines. The beneficial effect on the bowels has doubtless been the chief cause of the lozenge having become so much liked, so continuously persevered in, and so extensively used. Sulphur in small doses is sometimes useful in affections of the pulmonary mucous membranes. 7. Sulphur has long had a reputation, and doubtless is of much value, in

diseases of the skin and its appendages. 8. Some arthritic diseases, especially chronic forms of rheumatoid arthritis and gout, and also many cases of muscular rheumatism, are much benefited by the continued use of small doses of sulphur.

THE USE OF GLYCERIN ENEMATA AND SUPPOSITORIES.

In the *Vratch*, Nos. 1, 3, and 4, 1889, p. 1, DR. ALEXANDR S. POLÜBINSKY, of St. Petersburg, publishes an ably-written and very instructive paper on the treatment of constipation of various forms by means of glycerin, administered in the shape of either enemata or suppositories. The paper is based on fifty cases from Professor V. A. Manasseïn's clinic, of which, in forty glycerin enemata and in ten Boas's suppositories were employed. As regards the quantity of glycerin used for an enema, in one case 1 gramme was injected; in nineteen cases, 2 grammes; in thirteen, 3; and in seven, 4. The suppositories contained invariably 2 grammes of the drug, the constituent being either gelatin or cacao-butter. Forty-five patients were men, aged from 12 to 55, and five women of from 10 to 40. The following brief summary deserves to be placed before our readers:

A. *Results of Clinical Experiments.*—1. In twenty-three cases (forty-six per cent.) the administration of glycerin was followed by abundant motions; in nineteen (thirty-eight per cent.), by scanty stools; and in eight (sixteen per cent.), no action of the bowels took place. 2. The first group includes: *a*, such cases where the presence of fæcal masses in the S. Romanum could be ascertained both by palpation and percussion; and *b*, such ones where the fæcal accumulation could be elicited only by percussion. In the former subdivision the stools passed were solid and normally shaped; in the other they were rather loose (gruel-like). The first "call" was felt by the patient usually in one or two minutes to gradually increase in its intensity, and to be followed by a motion in three, four, or five minutes. The action was not attended or followed by any unpleasant sensations, except one case, where a rather vivid local burning was experienced by the patient for about fifteen minutes. A controlling enema, made of two and a half or three tumblerfuls of water, and administered after defecation, gave negative results (that is, the water returned unchanged) in nineteen cases, while in four the fluid was found to be intensely stained with fæcal matter. In one of the former nineteen cases, however, a subsequent administration of castor-oil (℥i) was followed by a rather abundant stool. 3. The second group includes: *a*, such cases (six) where an ordinary enema, administered subsequently, did not bring about any action of the intestines; palpation detected fæcal accumulation only in the sigmoid bowel, the cæcum being empty; *b*, such cases (nine) where a glycerin enema produced only scanty stools, but a subsequent ordinary enema was followed by a free discharge; the examination proved that both the sigmoid bowel and cæcum (in other words, the whole large bowel) contained solid or loose fæcal masses; *c*, such cases (four) where an after-glycerin aqueous enema remained inactive, but a dose of castor-oil caused abundant motions. The examination gave the same results as in the preceding subdivision, the cases concerning constipation of two or three days' standing. 4. The third group refers to such cases where glycerin gave rise solely to fleeting "calls," but otherwise remained quite inert, stools following a subsequent administration of ordinary enemata or castor-oil. 5. In the shape of suppositories, glycerin acts somewhat more slowly than when injected into the rectum, stools taking place in ten, fifteen, or eighteen minutes, which depends simply upon the circumstance that gelatin and cacao-butter require a certain time for their liquefaction. 6. The "calls" induced by glycerin are short-lasting, and when the patient postpones or inhibits his defecation beyond the time indicated above, it may sometimes happen that no stool takes place at all.

B. *Theory of the Action of Glycerin.*—1. The eccoprotic action of the drug cannot possibly be attributed to anything like its softening or liquefying fæcal masses, since (*a*) water, milk, olive-oil, and other fluids, when injected into the rectum in similarly small quantities (6 grammes or so), fail to excite any motions; (*b*) when injected in such trifling doses, glycerin is rapidly absorbed by the mucous membrane; (*c*) stools occurring after glycerin enemata are usually solid and sausage-shaped,—that is, show no signs of liquefaction; (*d*) neither are the masses covered with any watery or slimy layer; (*e*) stools take place within a short time after the administration of glycerin, while the liquefaction process should necessarily require a comparatively long interval. 2. Glycerin undoubtedly causes a local irritation (probably congestion of the rectal mucous membrane, sin-

(*a*) all patients experience a sensation of warmth or some burning in the rectum; (*b*) there is observed a slight rise of the rectal temperature after the enemata; and (*c*) on a digital exploration during "calls" there are detected fairly strong contractions in the upper portion of the rectum. The drug, however, does not increase the secretion of the rectal mucous membrane. 3. The irritation lasts until a complete absorption of glycerin. Possessing a great absorbability, the substance very rapidly penetrates into the (very rich) lymphatic vessels of the rectum, and, having disappeared from the latter, ceases to act. Hence it is unable to establish any considerable peristaltic action of the bowel lying higher up from the sigmoid intestine.

C. *General Conclusions.*—1. Best results are obtained from glycerin in cases of fæcal accumulation in the rectum and S. Romanum. 2. In cases of fæcal stagnation occurring higher up (typhlitis, general intestinal catarrh, etc.) the drug is altogether useless. 3. Glycerin enemata or suppositories are indicated, especially (*a*) as a means for "training" the rectum—that is, for exciting regular rectal "calls"—in cases of habitual constipation; (*b*) in cases of constipation caused by fæcal accumulation in the large bowel, and depending upon atonic state of the intestinal muscular coat, as occurring most commonly in women after parturition. Since intestinal atony in such patients is usually accompanied by a similar state of the abdominal press, a systematic employment of glycerin enemata must be obviously supplemented by daily abdominal gymnastics and massage, faradization of the abdominal muscles, and intrarectal galvanization; (*c*) in such cases where the rectum and sigmoid bowel are mechanically compressed by pelvic tumors (including early pregnancy); (*d*) in retroversion of the uterus associated with pressure on the rectum; (*e*) in children suffering from scrofula of a torpid variety; (*f*) in such persons who experience difficulty and pain on defecation because of their fæces being very hard, and who accordingly often abstain from stools. Here glycerin proves useful mainly as a local lubricant. 4. On the whole, glycerin enemata should be preferred to suppositories, since the latter (*a*) are more expensive; (*b*) their use is rather uncleanly (they easily melt in the hands, etc.); and (*c*) their introduction into the rectum by a finger represents a by far more unpleasant procedure than an injection by means of a syringe. 5. In one group of cases, however, suppositories are to be preferred to enemata. It is the group mentioned (sub. 3, *f*) where a relatively slow action is desirable, and where lubricant effects of glycerin are intensified by those of cacao-butter.—*London Medical Record*, March 20, 1889.

THE USE OF RECTIFIED OIL OF TURPENTINE IN CROUP.

DR. M. KEWENTANER in the *Wiener Medizinische Blätter*, No. 9, 1889, speaks in the highest terms as to the value of the employment of rectified oil of turpentine in idiopathic croup. He refers to the case of a boy, 2 years of age, who was taken sick in May last with cough, hoarseness, and symptoms of laryngeal obstruction. The latter symptom became so alarming that the little patient was sent to the hospital with the idea of having tracheotomy performed. When the author saw the patient he found him almost asphyxiated, with an absolutely aphonic cough, livid face, pulse scarcely detectable, and all respiratory movements of the chest invisible; while inspection of the throat showed great inflammatory reddening. A coffeespoonful of pure oil of turpentine was administered with all the necessary precautions, and ice compresses placed around the neck. During the night the patient rested somewhat, and slept for a few hours. In the morning a second similar dose of turpentine was given, and on the third day a mass of whitish-gray membrane was expectorated with coagulated mucus. The following prescription was then ordered:

> Oil of turpentine, 4 parts;
> Oil of sweet almonds, 10 parts;
> Simple sirup, 20 parts;
> Mucilage of gum arabic, 40 parts;
> Yolk of egg, 15 parts;
> Cinnamon-water, 50 parts.

Of this one coffeespoonful was administered every two hours; complete recovery followed. In a similar case, in addition to the internal administration of oil of turpentine, spraying of the throat was practised with the oil of turpentine, tincture of eucalyptus globulus, and carbolic acid, each 5 parts; alcohol, 300 parts; and distilled water enough to make 1000. The author claims that the administration of the oil of turpentine produces a violent cough, which is followed in a short time by the expectoration of copious mucoid sputa and the detachment of the croupous membrane.

THE COMPARATIVE VALUE OF THE DIFFERENT METHODS OF TREATING ACUTE GONORRHŒA.

Under this somewhat misleading head, DR. ANDRÉ MARTIN, physician-major, publishes an interesting article in the *Journal de Médecine*, in which he contrasts what he calls the old with what he calls the modern methods of treating acute blennorrhagia.

The old or classic treatment begins at a date more or less remote from the onset of the disease, respects the period called inflammatory, and is directed to the stationary period (*période d'état*) and period of decline; it is both general and local, including, with rest and dieting, the balsams (copaiba, gurjun, sandal) alone or combined with injections; the latter are astringent (sulphate of zinc, acetate of lead), or simply protective, like bismuth and silicate of potassium. All these injections have been accused of causing stricture, but the French writer declares it as his conviction that the duration of the flow more than the nature of the treatment contributes to the formation of consecutive strictures.

In a first series of clinical experiments, Martin, following the precepts of Fournier, treated all the patients of his army corps for a fortnight with local and general baths, emollient, mucilaginous drinks, bicarbonate of sodium, etc.; and it was not till during or at the end of the third week, when the discharge and micturition were without pain, that he began the use of copaiba, alone or associated with cubebs, and injections of sulphate of zinc,—one grain to the fluidounce, from one to five injections a day, in an increasing ratio up to five injections, then in a decreasing ratio back to one injection a day. During the stationary period the zinc injections are well borne, and seem to favor the action of the balsams; the latter were not always prescribed, but in all cases a mild and cooling dietetic regimen and the use of emollient drinks preceded the employment of the injections. The following are the statistical results of this method. The average duration of the treatment is based on the number of days spent at the infirmary or hospital.

Number of cases of blennorrhagic urethritis.....	62
Days of treatment.....	1684
Average duration.....	27.16

These figures agree to the fraction of a hit with the statistics of the Arzew Hospital, which, out of one hundred and thirty cases, give the average duration as 27.26 days. Since 1884 Martin has invariably had recourse to antiseptic agents in the treatment of acute blennorrhagia. He makes use of the three following formulæ, the preference being given to the $\frac{1}{20000}$ solution of bichloride of mercury:

1. Sulphate of quinine, 1 part;
   Glycerin, 25 parts;
   Distilled water, 75 parts;
   Acid sulphuric, q.s. to dissolve.

The above is a one per cent. solution.

2. Van Swieten's solution of bichloride of mercury, 10 parts;
   Distilled water, 190 parts.

The above is a very weak solution of the bichloride, 1 to 20,000.

3. Permanganate of potassium, .05 (1 grain);
   Distilled water, 100 (℥iii to ℥iiss).

The treatment is begun the day when the patient first presents himself at the hospital for treatment,—*i.e.*, generally from the second to the sixth day after the commencement of the discharge. Three injections a day are made, three syringefuls at a time. The injections are tepid, and tepid fomentations are kept continuously upon the penis. The injections are made with great gentleness. When the flow begins to dry up, the number of injections is decreased, till finally but one injection a day is made. The patient is kept in the hospital one week after cessation of all treatment, and is not discharged till he is believed to be absolutely well. The following table gives the results of treatment by antiseptic injections:

Agents employed.	Cases treated.	Days of treatment.	Average duration.
Sulphate of quinine (1 per cent. solution).	10	296	29.6
Permanganate of potassium (1 per 2000 solution).	47	1281	27.25
Bichloride of mercury (1 per 20,000 solution).	45	953	21.17
Total.....	102	2530	24.71

From the above, it will be seen that we have an average duration of 24.71 days, as contrasted with 27.16 where the treatment was according to the older "classic" methods.

It will be seen, too, that of all the agents employed, the sublimate injections gave the best results, the average duration of the disease, when treated by this antiseptic, being 21.17.

Antiseptic injections can hardly be said to constitute a "new treatment" of acute blennorrhagia, except in the fact of their application from the very commencement of the disease, and to the exclusion of all other treatment. It is surprising to see how little pain they occasion, even during the so-called inflammatory period, and they seem to produce rapid amelioration in the intensity and nature of the discharge. According to Martin, this treatment is much less liable to be attended with complications, such as orchitis, cystitis, prostatitis, than the ordinary treatment, and he presents statistics to prove his affirmation.

During the antiseptic treatment no special care about diet seems necessary. Sometimes full doses of bromide of potassium (60 to 90 grains) prove a useful adjuvant, especially in cases of "exaggerated erethism;" an occasional injection of 1/6 of a grain of morphine in the lumbar region may be indicated. In cases complicated with chordee, lavements or suppositories containing 15 grains of chloral sometimes give excellent results.

In cases complicated with cystitis, orchitis, or prostatitis, the microbicide injections are to be suspended to give place to emollients and sedatives.

It is worthy of remark that the results of the germicide treatment, as given by Martin, are much inferior to those claimed by some other authorities, notably Bourgeois, Chameron, and Constantin Paul.

The conclusion that patients are perfectly well at the time of discharge from hospital in these cases deserves notice. Nothing is stated in the article to show that any unusual care is taken which would warrant such a conclusion. There is nothing to show that in these patients a thin, transparent, gleety discharge does not appear, as in other patients, a short time after their return to duty. It is not easy to determine that a given patient is actually cured of gonorrhœa. The optimistic views of Dr. Martin need to be balanced by more philosophical and scientific views, such as those advanced by Drs. Bryson and Burnett in the *Journal of Cutaneous and Genito-Urinary Diseases*. These authors confirm previous observation that the gonococcus of Neisser persists in some cases after all discharge has ceased, and thus acute symptoms may be lighted up by any undue excitement.—*Boston Medical and Surgical Journal*, May 2, 1889.

TREATMENT OF RHEUMATISM.

At the meeting of the Clinical Society of Manchester, held April 16, 1889, DR. W. M. MACCALL read a paper on the treatment of the various forms of rheumatism (*British Medical Journal*, May 4, 1889). After reviewing the previous treatment of acute rheumatism during the last twenty-five years, Dr. Maccall considered the value of the present routine treatment by salicylic acid and its allies or derivatives under the following headings: 1. In relieving pain and lessening fever in acute rheumatism, the salicyl treatment was undoubtedly the most effective known. 2. The salicylates did not prevent the rare complication of hyperpyrexia, and were absolutely useless in its treatment. 3. It was doubtful if they prevented endocardial or pericardial troubles, the percentage remaining about the same (fifty per cent.) since the salicyl treatment as before. They seemed to have no influence in curing these troubles when they did occur. 4. There was no proof that the salicylates prevented relapse. 5. It was not proved that the salicylates lessened the duration of the disease nor that they prevented anæmia. With regard to the particular form of the remedy most writers recommended, and Dr. Maccall agreed with them, salicylate of soda in 20 grain doses at first every hour for three or four hours, according to circumstances. It should be continued in diminishing doses for at least eight or ten days after all pain and pyrexia had ceased, and in most cases should be followed by iron. Salicylic acid, salicin, and salol might be tried in exceptional cases where the soda salt was not well borne. In young children, antipyrin might be substituted with advantage. In convalescence, Sir A. Garrod's alkaline mixture, followed by iron, was advised; and if any joint remained stiff or swollen, blistering or painting with iodine was useful.

NETTLE-JUICE IN THE TREATMENT OF HEPATIC COLIC.

In the *Revue Générale de Clinique et de Thérapeutique* for April 4, 1889, DR. HUCHARD refers to the juice of the nettle (*Urtica dioica*) in the treatment of biliary lithiasis. The fresh nettles should be crushed in a mortar and a wineglassful of the juice taken in the morning while fasting. According to Dr. Masbrenier this treatment, if persisted in for a month, will prevent the return of hepatic

colic. If this treatment possesses any value it is doubtless to be attributed to the presence in the nettles of the nitrate of potassium and the carbonate of ammonium.

A DIAGNOSTIC SIGN OF TYPHOID FEVER.

The following particulars of a very remarkable aid to the diagnosis of enteric fever, contributed by DR. HOWARD TAYLOR to the *Lancet* for May 4, 1889, can hardly fail to be of value to the profession; the more so that many cases of this protean malady are extremely atypical, so as to be very difficult, or even impossible, of diagnosis; while obscure cases of other diseases are continually arising which so closely resemble typhoid fever that one cannot express any certain opinion as to their nature. By the aid of this additional sign it is claimed that one is able either to arrive at a more definite diagnosis, or else to exclude typhoid fever in not a few of such cases; when, but for this additional evidence, the nature of the patient's illness must have remained either altogether, or at least for some time, a matter of doubt.

In the year 1882, Dr. Ehrlich announced the fact that the urine of patients suffering from typhoid fever gives a reaction—with one of the aniline derivatives—different from that of normal urine and from the reaction of the urine of patients suffering from other diseases.

His test solutions are as follows: *A*, a saturated solution of sulphanilic acid in dilute (1 in 20) hydrochloric acid; *B*, a .05 per cent. solution of sodic nitrite in distilled water. (Both of these solutions must be fresh, especially the latter, which cannot be depended on for more than a week at the longest. When they are mixed, of course, a solution of sulphanilic acid containing free nitrous acid is produced, which is the actual test solution; but, on account of the extreme instability of the latter, the two solutions must be mixed fresh at each testing). In using the test, about 25 parts of *A* are added to 1 of *B*. Mix with this an equal bulk of the urine to be examined, and render alkaline with strong ammonia.

It is thus seen that the test referred to by Dr. Taylor is not a new one, and it could scarcely seem that a fact which has been known so long and used so little could be of great value. Dr. Taylor, however, states that, at the suggest of Dr. Sansom, he applied it to a large number of cases with the following results:

With normal urine, the only change which ordinarily occurs is a mere deepening of its color to a sherry or vinegar brown. In conditions of pyrexia other than typhoid fever the color also deepens, but still remains merely brown, although usually it becomes of a darker tint than the average color given by normal urines. But when the test is applied to the urine of a patient with enteric fever, the color rapidly turns red, the exact tint it acquires varying from the yellowish-red of bichromate of potassium solution, though ruby-red, to a rich port-wine color. On shaking the test-tube a froth is produced, which has usually a delicate pink color that is very characteristic.

Such is the reaction; now as to its limitations. In the first place, it is not *always* given until the latter part of the first week; but as the case frequently does not come under observation till then, this does not greatly limit its usefulness. And again, after the morning temperature has once reached normal during the intermittent stage (usually in the fourth week) it may—though it frequently does not—cease to be given.

Dr. Taylor adds that, as far as his experience has gone, the reaction is present during a great part of the febrile period, *in every case*. It is this which constitutes the great value of the test.

If it had been found—as one could have wished—that typhoid fever was unique in this respect, the test would have been by far the most reliable sign we possess, as being the only invariable one. But, unfortunately, *in exceptional cases*, the reaction is given in other diseases. Herein lies its weakness. However, while in most diseases it is a more or less rare exception, it seems to be an invariable (or almost invariable) rule in enterica. Occasionally, even in the urines of healthy subjects, a slightly reddish color is developed; but this is *very* rare, and the redness is hardly ever well marked; indeed, the deep rich crimson which is given in so many cases of enteric fever never being produced.

Apart from conditions of pyrexia, Dr. Taylor states that he has notes of cases of Bright's diseases, both acute and chronic, which gave this "typhoid reaction;" indeed, in albuminous urines he has found it more frequently than might be expected; but with this exception it is extremely rarely given by the urines of patients whose temperatures are normal. Thus, out of a large number of cases of valvular disease of the heart, it only

occurred in one in which hysteria was well marked. In chorea a slight reaction was given in one out of six cases. In two cases of diabetes mellitus and one of diabetes insipidus the reaction has not been given on any occasion. In febrile diseases it seems to be especially common in measles; while in acute tuberculosis, which of all diseases perhaps most often simulates typhoid fever, it has been absent in each of several cases that he has examined. In acute and advanced chronic phthisis reaction has been obtained in a few of a good many cases, but in the ordinary cases of this disease it has not been detected. In cases of lobar and of lobular pneumonia none of the urines have turned red. In only two of a large number of cases of acute rheumatism has the reaction been present.

From the above facts it would seem that the following conclusions can be drawn from Ehrlich's test. The absence of the reaction is practically proof positive that the case in question is not one of enterica (provided that the disease has lasted six days or more, and that the temperature has not yet fallen to normal). Its presence suggests—but does not prove—that the case is one of typhoid; the probability being greater the deeper the tint produced. And as the other diseases in which it occurs least rarely are not those which most closely resemble typhoid fever, but the reverse, the significance of these exceptions is very greatly diminished.

PERCHLORIDE OF MERCURY AND CANNABIS INDICA IN DYSENTERY.

In the *Indian Medical Gazette* for March, 1889, MR. MATTHEW D. MORIARTY states that after noting the great value of perchloride of mercury in many cases of diarrhœa, he was induced to try it in acute dysentery, and the results were highly satisfactory. He likewise states that some time ago he gave cannabis indica a short trial in the treatment of dysentery, but at that time found little or no benefit from its use. Recently, he writes, he tried it again against the perchloride, with the result that in some cases it appeared to be of considerable value, while in others it was quite ineffectual. At this time some cases occurred which did not yield readily to the perchloride treatment, and he found that an addition of ten minims of cannabis indica to each dose of the perchloride mixture was in each of these cases followed by rapid improvement and cure. The form in which he prescribes it is half a drachm of the solution of perchloride of mercury, ten minims of cannabis indica, in an ounce of tragacanthia mucilage. This mixture is given from four to eight times daily, according to the urgency of the case.

THE EMETIC PROPERTIES OF THE MEADOW DAFFODIL AND THE BARK OF THE ELDER-TREE.

The meadow daffodil, although but seldom employed as a drug, possesses marked emetic properties; its infusion has an agreeable taste, and readily produces vomiting in both adults and children. It may be prescribed in the form of a decoction of sixty grains of the narcissus in five ounces of boiling water, sweetened with sirup. The bark of the elder-tree in the fresh state likewise possesses cathartic and emetic properties, which, in certain cases, may be utilized to advantage. Dr. Bastoki recommends the decoction of seventy-five grains of the fresh bark of the elder in an ounce and a half of water. DR. HUCHARD, who contributes these facts to the *Revue Générale de Clinique et de Thérapeutique* for April 4, 1889, states that while he has had no personal experience with the emetic properties of the bark of the elder, he has frequently employed the infusion of daffodils with marked success.

BROMIDE OF POTASSIUM IN OVARIAN ACNE.

In the *Practitioner* for May, 1889, DR. ARTHUR JAMISON writes that he has seen many cases of acne coincident with, if not caused by, ovarian irritation and its attendant menorrhagia. He reports one very striking case in which the bromide of potassium was used with the idea of relieving profuse menstruation; but, in addition to accomplishing this result, it produced a very surprising improvement in the condition of her skin, which was before the seat of an unusually marked form of acne. He prescribed 20 grains of potassium bromide, in infusion of gentian, three times a day, and, with the disappearance of the profuse menstruation, there was almost complete cure of the acne. Dr. Jamison thinks that this case, which he says is similar to four others which he had under his care, shows that constitutional remedies are in many cases preferable to local measures, and he concludes that among the causes of ac

in women ovarian congestion is one, and when acne is due to that cause potassium bromide is at present our most efficient remedy.

THE ACTION OF MORPHINE ON THE UTERUS.

About three years ago DR. LUTAUD reported to the Société de Médecine de Paris some observations which drew attention to a hitherto unnoticed symptom of chronic morphinism. The author showed that morphine has a special elective action on the ovaries, and that it either diminishes or causes the disappearance of the menstrual function according to the quantity of the poison absorbed. In the *Revue Générale de Clinique et de Thérapeutique* for May 2, 1889, he adds a number of additional facts, on which he bases certain conclusions as to the therapeutic indications for the use of morphine in this connection. He states that he has observed complete suppression of the menses in eighteen cases of women addicted to the use of morphine, all of whom had commenced the use of morphine as a consequence of more or less serious uterine disorders. As a consequence of the fact that suppression of menstruation was produced by morphine, Dr. Lutaud was lead to test the use of morphine in various affections, such as fibrous tumors of the uterus which were aggravated by menstruation, and he states that he has employed morphine in cases of uterine cancer and of fibrous tumors with very satisfactory results. He reports a number of cases which seem to warrant his conclusion that, since morphine suppresses menstruation, it may be employed with profit to combat uterine hemorrhages of nearly all varieties.

THE MOVEMENTS OF RESPIRATION.

DR. MAX MARCKWALD has recently published an elaborate monograph on the movements of respiration, with an account of their innervation, which has been translated by Mr. Thomas Arthur Haig, published in London by Blackie & Son. This essay contains so many new facts, and the author's conclusions are of such general medical interest, that we publish in full the summary of his results.

"1. In the *medulla oblongata* there lie in close connection with the roots of the vagus the centres of respiration: a centre of in- a more difficultly excited centre of expiration. During normal respiration the centre of inspiration alone is active, while the centre of expiration becomes active only under exceptional circumstances. It is an auxiliary centre of respiration.

"2. There are no centres of respiration situated higher in the cerebro-spinal axis. All phenomena which have suggested the existence of such a centre can easily be explained as centripetal stimulations of the *medulla oblongata*, which, by reflex action, act on the respiratory centre in the fourth ventricle. The manner in which head-dyspnœa takes place and disappears is a fact against the existence of higher situated centres.

"3. In the cervical part of the spinal cord there are only the central tracts of respiration; special centres for the liberation of respiration do not exist there.

"4. The respiratory centre in the *medulla oblongata* not only acts automatically, but can be excited by reflex action.

"5. The automatically active centre can only liberate respiratory spasms, not regular rhythmic respiratory movements.

"6. Normal rhythmic respiration is a reflex act, mainly liberated by the vagi, which prevent the gathering tension in the centre becoming too great, and convert the inherent stimulations of the respiratory centre into regular respiratory movements. The action is that of a 'discharger.'

"7. The vagi constantly stimulate; they possess tonus, and are sufficient to serve as the only active regulators of respiration. During absolute rest of the animal organism they probably act alone.

"8. Next to the vagi the upper brain-tracts are of great importance for the liberation of the regular rhythmic respiration. They are capable of replacing the non-activity of the upper tracts. During sleep, during hibernation, or after certain narcotics the reflexes from the upper tracts on the respiratory centre often remain active.

"9. If a portion of the upper tracts remains non-active while the vagi are still active, then periodic respiration may take place (Cheyne-Stokes's respiration).

"10. For the accomplishment of the periodic respiration a change in the excitability of the respiratory centre itself is not necessary. The latter can be excited during periodic respiration at the time of the periods as well as during the pause, equally powerfully by means of weak shocks of the same strength.

"11. The sensory nerves of the skin can-

not take the place of the brain-tracts or of the vagi.

"12. While the cutaneous sensory nerves in animals which are intact exercise very gentle, perhaps almost no, influence on the respiratory centre, this influence increases greatly after the brain-tracts become non-active. In these circumstances, skin reflexes are capable of liberating complete series of respiratory movements. The cutaneous nerves possess no tonus.

"13. The centripetal nerves, which have an inhibitory action on the liberation of respiratory movements, as, for instance, the *trigemini*, *laryngei superiores*, and *glossopharyngei* possess no tonus, and must be regarded as auxiliary nerves of respiration; during normal liberation of respiration they are not in activity.

"14. The *trigemini* and *laryngei superiores* (as well as olfactory and splanchnic nerves) on stimulation cause slow respiration, and at last stop it altogether in a position of expiration, while the *glossopharyngei* have no influence on the frequency of respiration. The action of the latter is always an absolute inhibition of respiration, and this in every phase of the same in which the stimulation becomes active.

"15. A single electric shock cannot of itself set the respiratory centre into activity, but only when its action is strengthened by other (intracentral chemical) stimulations.

"16. The shortest irritation of the respiratory centre that can be caused sends to the phrenics four active, simple shocks, at intervals of about one-twentieth of a second.

"17. The normal stimulation of the respiratory centre does not depend on the blood; neither from deficiency of oxygen nor from too large a quantity of CO_2 in the blood. Animals continue to breathe without a circulation, and, after bleeding, for a considerable time.

"18. The Hering-Breuer mechanical respiratory theory is just as far from being correct, because after opening of the pleural sacs, and even after extirpation of the lungs, rhythmic respiration continues.

"19. The active stimulating matters of the respiratory centre itself are probably of a similar nature to those which stimulate the isolated heart; perhaps the products of decomposition of intercellular fluids.

"20. Apnœa has nothing to do with the gas contained in the blood, but depends probably on the removal of the stimulations stored in the centre, by means of the vagi in a state of tonus. Therefore, after section of the vagi, the production of apnœa is difficult, and it lasts only for a short time.

"21. During apnœa one can neither, by means of direct stimulation of the *medulla oblongata* nor of the central vagi, liberate respiratory movements.

"22. The respiratory centre of the fœtus, during respiratory rest in the uterus of the mother, is in a condition of much lower excitability than after birth.

"23. When central or peripheral stimulations during the act of birth have once caused respiration, then the continuously-stimulated respiratory centre does not readily lose the stimulating impulse, and respiration goes on in a regular rhythmic manner.

"24. Different phenomena, as the common salt dyspnœa and the cold dyspnœa (heat dyspnœa?) make it probable that the phrenics carry stimulations direct from the surface of the brain, from a motor centre in the same, evading the respiratory centre in their passage downward.

"25. The presence of the sensory fibres in the phrenics, as well as the extremely delicate muscular sensation referred to the diaphragm, support this view.

"26. Rabbits, from the age of 4 to 5 months, after division of the phrenics, may live; younger ones die from insufficiency of air, in consequence of incomplete expansion of the thorax."

THE PHYSIOLOGICAL PROPERTIES OF THE ANILIDES.

In the *Revue Médicale de la Suisse Romande* for April 20, 1889, is a partial report of a series of researches made by M. BINET as to the physiological properties of certain anilides. This group has recently furnished numerous additions to therapeutic substances, acetanilide, benzanilide, phenacetin, and methylacetanilide, the latter being described under the name of exalgine in our last issue. These substances are as closely allied in their physiological as in their chemical affinities. They paralyze the motor power, arrest the heart, reduce hæmoglobin, and are eliminated through the urine after being transformed into anamido-phenol. They all reduce temperature. The different principles vary in the character of their action on the nervous centres; thus formanilide produces torpor, and in highly toxic doses fibrillary contraction; methylacetanilide produces epilepti convulsions and collapse. Binet further dra

attention to the fact that the toxicity of these substances augment with their molecular weight.

HEART COMPLICATIONS IN GONORRHŒA.

According to the Vienna correspondent of the *British Medical Journal* for May 11, 1889, DR. A. GLUZINSKI, in a recent number of the *Przeglad Lekarski*, gives some interesting details with respect to affections of the circulatory organs depending on gonorrhœa. The frequent occurrence of joint affections in connection with gonorrhœa had long been known, whereas complications connected with the serous membranes of the internal organs, such as that of the heart, were unknown till recently. Brandes, in 1854, first published two cases in which gonorrhœal rheumatism was followed by endocarditis and pericarditis respectively. Sigmund observed two cases of gonorrhœal rheumatism of the joints in women, with subsequent pericarditis. Since 1872 the number of observations became larger and larger, so that Dr. Gluzinski had found records of thirty-one cases. The following conclusions might be derived from these observations: 1. Pericarditis, as well as endocarditis, might supervene in the course of gonorrhœa. 2. These complications might develop after gonorrhœal rheumatism, but also without the presence of such an affection. 3. The complaint often assumes the character of a severe infectious disease, as in endocarditis ulcerosa, runs an acute course, and sometimes gives rise to failure of the heart. The fact that, of the thirty-two cases published, in only two were the patients women, might be explained by the suggestion that in the case of acute rheumatism in the female sex the presence of a simultaneous gonorrhœa was less frequently inquired for. As to the causal connection of the affections of the heart with the urethral affection, Dr. Gluzinski argued that it must not be supposed that these complications were analogous to orchitis or cystitis set up by extension of the inflammatory process *per continuitatem* or *per contiguitatem*. Dr. Gluzinski thought the following the most probable explanation. Since the discovery by Neisser of the gonococcus, which was the pathogenic micro-organism of gonorrhœa, the synovial fluid in cases of gonorrhœal rheumatism of the joints has been repeatedly examined for specific micro-organisms. Different results have been obtained by different investigators. Some, who believe they have discovered a specific [illegible] consider the rheumatism to be a direct result of the gonorrhœa. Others, again, who have failed to find gonococci or other pyogenic micro-organisms in the synovial fluid, regard this affection as a secondary one due to the penetration of pyogenic micro-organisms, owing to a lesion in the urethral mucous membrane. It was very probable that the same organism, after it had got into the circulatory system, produced in the serous membranes of the heart affections analogous to those in the joints. This hypothesis was confirmed by the case published by Weichselbaum. In that case gonorrhœa was complicated with endocarditis and cardiac failure, and the streptococcus pyogenes was proved to be present in the vegetations on the valves. Dr. Gluzinski said that complications did not always occur in so acute a form as the endocarditis ulcerosa or pericarditis acuta. In eight cases which he had observed, these complications were of a very mild character. The patients complained of "stitch" in the left chest and palpitations of the heart. There was accelerated and increased action of the heart, and frequently also a slight pericardial crepitant râle. In spite of the most careful examination, no other affection could be detected but gonorrhœa. These cases mostly ran a rapid and mild course, and might very easily be overlooked. They deserved the greatest attention, however, as endocardial murmurs and cardiac failure came on in two of these cases. In the majority of these cases rheumatism was either quite missed or came on after the cardiac affection had set in. In all these cases there was gonorrhœa of long standing. Gluzinski concluded that just as acute affections of the heart occurred in acute gonorrhœa, mild diseases of the serous membranes of the heart could also supervene in the course of chronic gonorrhœa.

BROMIDE OF SODIUM IN INTOLERANCE FOR QUININE.

KRASTILEVSKY states in the *Internationale Klinische Rundschau* for May 12, 1889, that he recently had under his care a young girl suffering from intermittent fever, in whom quinine, even in extremely small doses, produced marked erythema. This intolerance for quinine was overcome through the simultaneous administration of bromide preparations, the best results being obtained through the use every two hours of a dessertspoonful of a two and a half per cent. solution of bromide of sodium. This entirely prevented the occurrence of erythema after the administration of quinine.

Reviews.

THE PSYCHIC LIFE OF MICRO-ORGANISMS. A STUDY IN EXPERIMENTAL PSYCHOLOGY. By Alfred Binet. Translated from the French by Thomas McCormack. With a preface by the author, written expressly for the American edition.

Chicago: The Open Court Publishing Co., 1889.

This book provides, after a fashion, an antidote to the teachings of modern science in regard to inferior life. The author might just as well have called his work "The Loves of the Infusoria." And his whole aim is to excite rather than prove the idea that there is volition, like human volition, sexual instinct, and selective effort, as far down in the scale of inferior life as the eye of man, aided by the microscope, can pierce. To many who have thought but little about it, who have never investigated the matter personally, and to whom the recent discoveries of the microscopist are all an unknown field, the book well seems but a fairy-tale or a scientific hoax; but throughout his deductions and inferences the author has the strong support of recent observations. True, he has massed together the work of many observers, and has drawn obvious deductions where others have but recorded what they saw; but we think that he has quoted fairly from his authorities, and the reader is at liberty to arrive at other conclusions if he can.

"Psychic life" is soul life, and the author would lead us to believe that not only do we and the higher animals possess the mystery of a soul, but that we share it with the spermatozoid and the ovum. Not only do we and the higher animals, vertebrate and invertebrate, feel the sexual passion, but such little atoms as the paramœcium aurelia and the chilodon encullulus feel it also. Well may a recent poet write—

> "We are greater, my bacilla,
> Than all monarchs; for me seems
> We need but exist to fill a
> Strong man's brain with fever dreams.
> Such the thought my passion kindles,
> Oh, my microscopic bride!
> Kiss me! Although twenty Tyndalls
> Have their eyes upon the slide."

Really, it almost causes the most hardened cheek to blush as one reads the graphic description of fertilization of star-fish. The struggle of the spermatozoids, the successful arrival of the most vigorous, the advance of the ovum to meet it, and the fusion of the two elements in mysterious union, seem but the repetition, far below the line of ordinary "mortal ken," of the sexual union of the maturer animals to which they belong. It seems a mimic reproduction of the whole matter, and brings us many steps nearer to the solution of the one great question of the living world. Many steps nearer, yet, perhaps, practically as far off as ever. It seems to the reader, however, like the last step on the threshold of Isis's temple, the last step before the impenetrable veil.

Has the reader ever considered the astounding life-history of the spermatozoid, his determination and fixed purpose to go in one direction only, the actual length of his journey, if compared with his own insignificant size, the obstacles before him, and wondered what could lead him on so unerringly? The author thinks the question already answered. The spermatozoid is created with an inordinate fondness for certain chemical substances, which vary with the different species of germ in question. Thus, for the spermatozoids of the confervæ cane-sugar is the seductive allurement. No glucose or saccharin, no modern sophistication, will suffice. He wants the pure article, and his ovum affords a supply. A touching instance of the fondness for sweets, so common in the human infant. Can it be, sweet thought, that the longing for lollipops is a basic instinct, capable of leading us, on investigation, to the secrets of life and our own origin? If we are developed from a primoidial cell, perhaps we did not all start from the same one. Now, Pfeffer finds that the spermatozoids of the pteris serrulata and others are incited by malic acid,—the acid of the apple. Does this point to a deeper meaning in the story of Eve and her temptation? The ovum offers the malic acid to the male spermatozoid. Further comment is unnecessary.

And so real is this matter that the author describes and urges the use of a "spermatozoid test" of the purity of certain substances. In sugar, for instance, it would do away with the spectroscope, and for cider and pure cider vinegar now; but, alas! the eels would make short work with the puny reagents.

The author—to his own satisfaction any way—traces the beginning of soul life to protoplasm. Protoplasm sees and hears, exercises volition and love, can feel and manifest also the passions of anger, envy, disappointment, can make mistakes, blunder into wrong paths, retrace its steps, be frightened, flee away, lurk in hiding from a more powerful enem

or in ambush for its prey, can attack and repulse attacks; in short, can be proved to do all that man and the higher animals can in the way of volitional life. But he has not yet succeeded in accrediting to its "consciousness" the beautiful but chance flower of evolution. But by his own line of argument that is but a question of time and research, or of our own limited powers of observation, for he proves that, as all life originates from protoplasm, so protoplasm must contain in itself, even if in embryo, all of life. All the powers that unfold, as we mount the scale, have, of necessity, been locked up in the original cell, so that the stentor may, for all we know, be capable of meditating upon his own bart bulle, and the "podophrys fixa" may wonder why he should be born to succumb to the coleps hirtus. In fact, viewed through the author's (microscopic) glasses, the living world seems more mysterious than ever; and, to revert again to our poet, it is doubtless a field of vast amusement, for all we know, to the infusorial world to "see the necks"

> "Of these mighty men of science,
> Over the microscope bent low;
> While beneath them, in defiance,
> Spins the merry vibrio."

E. W. W.

THE MEDICAL ANNUAL AND PRACTITIONER'S INDEX. A WORK OF REFERENCE FOR MEDICAL PRACTITIONERS, 1889. Seventh year.
Bristol, England: Jno. Wright & Co., Stonebridge.
London, England: Hamilton, Adams & Co., Paternoster Row.
New York: E. B. Treat.
Toronto: J. A. Carvette & Co.

We take great pleasure in again noticing the "Medical Annual." If this were a voluminous, cut-and-dried compendium of extracts, it would not deserve the place it occupies, or the time it takes to read it; but this "Annual" is so full of live matter, and the dead limbs of last season have been so thoroughly pruned away, that it comes to the reader like a breath of fresh air medicated.

The volume for 1889 opens with a "Review of Therapeutic Progress for the Year 1888," by Percy Wylde, M.D., which is largely devoted to the topic of the primary and secondary action of medicines. The writer of this introductory chapter has evidently perused with interest Dr. Boardman Reed's article in the *Practitioner*. The seed has evidently fallen upon fertile ground, and the author gives us the entire question, with copious extracts. As for his own opinion, we [illegible] writing, p. 6, "It would be useless to waste time in discussing in the abstract whether Dr. Reed's views represent a whole or only a partial truth. Clinical experience is the only test, and the illustrations which he gives, together with those with which recent medical literature abounds, are of more value than pages of theoretical reasoning." And further: "The question is one of great practical importance, for, if Dr. Reed's conclusions are correct, it opens a way of overcoming the great obstacle to therapeutic advance; it renders it unnecessary that we should wait until we know the exact nerve-centres, which arsenic and podophyllin depress, to cause diarrhœa, before we make use of them for its cure. All that is necessary is, that we should know by clinical observation the precise form of diarrhœa which each produces, together with their general effects on the patient, and it follows that a small dose will cure that form which most closely resembles the toxic effects of the drug."

But while admitting that Dr. Reed has some basis of fact on which to rest his published opinions, Dr. Wylde, in the article under consideration, goes farther, and traces these views of medicinal action back much farther than Dr. Reed has done. While Dr. Reed quotes Stillé and other recent authorities as giving a good ground for his work, Dr. Wylde goes farther back. He finds Claude Bernard putting it as an axiom that "every substance which in large doses abolishes the property of an organic element stimulates it when given in small ones." He traces it to Hippocrates, and in an essay published in *Hufeland's Journal* in 1796, on the "Curative Powers of Drugs," he finds "most medicines have more than one action. The first, a direct action, which gradually changes into the second, which I call the indirect secondary action; the latter is generally a state exactly the opposite of the former." So, we see that, whether these views are "whole truths or half truths," their original discovery is to be credited not to Dr. Reed, though undoubtedly original with him, but to an unknown therapeutist writing in the end of the last century.

We have devoted considerable space to this subject because it is one which has excited some discussion in the THERAPEUTIC GAZETTE and elsewhere, and because it is always possible that there may be some truth even in apparent error, and the office of the investigator is to discover for it rather than uphold theories. The real work of the book, however, is divided this year, as last, into the two sections of "New Remedies" and "New Treatment."

The list of new remedies (including the new applications of old ones) seems more brief than in last year's "Annual." The arrangement is alphabetical in both sections.

Acetanilide and acetphenetidin, agaricus and amylene hydrate have considerable space allotted to them. There is quite an extensive article on antipyrin, concerning whose action the author gives some new ideas and theories, which are worth attention. Throughout the book one cannot but see that the keynote was struck in the introductory on the double action of drugs. Take calcium sulphide. Of it we are told that "in full doses it increases the rapidity of suppuration in boils and abscesses, and in smaller doses will cause resolution where the suppurative process threatens but has not commenced." This drug is also recommended in leucorrhœa, in specific vaginitis, rhinitis, and catarrhal deafness. Cascara, and its claims in rheumatism, are discussed, but a long and patient trial of it has convinced the reviewer that the cases capable of benefit must be rare. Creoline is highly recommended in catarrhal inflammation as a local agent. Under veratrum viride we find the results of Dr. Christovich from weak solutions (one per cent. solution of the fluid extract), as given in the *Rev. de Cien. Med. de Barcelona.* 1. The drug increases the heart's contractions, strengthens its action, and increases the fulness of pulse. 2. A decrease in the heart's activity in cases of violent cardiac action. 3. Congestions of liver, lungs, and kidneys cured or improved. 4. Secretion of urine increased, and so on. The doses of the above solution given were 10 to 20 drops; and here, again, the author states that, if surprised, the reader can understand it better if he considers "that by using the weak solution only the primary stimulant action is obtained."

Under "Iodine," a case is given of vomiting after labor cured by 5 drops of the tincture in water. After discussing the case, the author sagely says, "This case might be taken by Dr. Boardman Reed as a happy illustration of his theory."

Under "Pyridine," the conclusions of Dr. De Renzi are given, the last of which is, "Pyridine has conquered angina pectoris."

The article on "Massage" is a thoroughly practical one, well illustrated. It is from the pen of Thomas Stretch Dowse, M.D. The Weir-Mitchell treatment is also considered at length. "Electro-Therapeutics" is contributed by Kenneth Millican, B.A. Cantab., M.R.C.S., and is an exceedingly practical, condensed article on the subject.

In the section on "New Treatment" the volume is rendered more valuable by a condensation under each topic of the new treatment for the same condition as given in the volumes for 1887 and 1888, with page references. This enables one at a glance to see all the valuable suggestions of the preceding three or four years under their appropriate topic. We feel sure the readers of the "Annual" will coincide with us in thinking that, whether heretical or orthodox, the "Annual" is a live, useful book, and deserves a place in every library.

E. W. W.

AN ELEMENTARY TREATISE ON HUMAN ANATOMY. By Joseph Leidy, M.D., LL.D. Second edition. Philadelphia: J. B. Lippincott Company, 1889.

We have carefully looked over the above work, and the result has been that we are forced to one conclusion,—it is that its excellency is such as to leave no place in our mind for anything but praise. The number of years that Dr. Leidy has been engaged in teaching medical students human anatomy must eminently qualify him for the authorship of such a volume. The clearness of his descriptions, the manner in which difficult and obscure points are rendered easily understood, and the very apt explanations to impress facts upon the students are all evidences of his ability and suitableness for the task.

In making a comparison of the present edition with the first edition of Dr. Leidy's book, which was published twenty-eight years ago, it is seen that the above volume is, indeed, a new work. The size is increased from 663 to 950 pages; the illustrations from 392 to 495, and the entire context is rewritten. The progress and changes made in this branch of medical science during so many years have been considerable, but nowhere do we find that the author has omitted to give us the most recent views. More especially is this noticeable in the sections relating to microscopical anatomy, so that the descriptions and illustrations of the histological structure of the tissues are very materially different from those given in the first edition. A conspicuous feature in the first edition of Dr. Leidy's book was the adoption of a plan to simplify the nomenclature, and he employed single names, "those most expressive of the character of the part; and, when admissible, the name is anglicized." This feature is, and

we think, properly, even more prominent in the present edition than it was in the former; and, in our opinion, it alone is one among other many good reasons which should induce teachers of anatomy to adopt this work as a text-book.

Correspondence.

PARIS.

(From our Special Correspondent.)

New Names for Copyrighted Medicines — Bismuth Citrate in Syphilis — Is Cancer Contagious? — A Monument to Dr. Auzoux—Completion of Dr. Dechambre's "Cyclopædia" — Medical Graduates decreasing in Number—The Therapeutical Congress —American Soldiers at the Exposition—The Eiffel Tower made Useful.

Quite a controversy is now raging in respect to the name of some new medicaments, chiefly chemicals of coal-tar origin. Both therapeutists and pharmacists, who are most interested, take a hand in what may properly be called a tourney of words. The trouble is about medicine of the antipyrin type, and the quarrel is a very pretty one as it stands. Most of these chemicals have been discovered in Germany, and, the French claim, owe their popularity to therapeutical researches made in France. As French law forbids the patenting of any medical compound, German inventors gave their chemicals fancy names and copyrighted the appellation,—a procedure not unknown in America,—and thus secured, for the time at least, a monopoly, which French pharmacists consider an evasion of the law and try their utmost to defeat. The fact is that, national rivalry being set aside, it is vexing to see foreigners obtaining by clever device a privilege denied to natives. The courts have been appealed to, but law's delays are the same here as elsewhere, so that in the mean time some means have been looked for to shake off the incubus. As the doughty Dr. Knorr holds fast to his copyright of the word "antipyrin," pharmacist Bourgoin, the director of the hospitals' central pharmacy, and a member of the Academy of Medicine, recently proposed that henceforth the compound be known under the name of "analgesine," and the Academy accepted his suggestion, recommending to all physicians to prescribe it as such. Unfortunately, the idea, a good one in itself, was in practice but a partial success, many doctors continuing to use the word antipyrin. Next, Dr. Dujardin-Beaumetz as chairman of a committee appointed to this effect, reported to the Academy of Medicine resolutions, declaring (1) that the physician may prescribe medicines by their vulgar names, and the pharmacist may dispense the same and enter them in the prescription-book by their scientific synonymes; (2) the attention of the public authorities is called to the necessity of revising pharmaceutical legislation. The resolutions were carried (April 30) with only one vote in the negative. The reasons given in the preamble for the first resolution were that in the same manner as a pharmacist dispenses magnesia sulphate, and enters the name as such, when Epsom salt is prescribed, so may he, when antipyrin is ordered, dispense dimethyloxyquinizine; diethylsulfondimethylmethan for sulphonal; and so on for the whole tribe of copyrighted articles when the prescriber mentions no maker's name. In this manner the dispenser could procure the articles in open market without paying tribute to foreign monopolists. The second resolution is a direct corollary of the first, pharmaceutical trade-marks being left in great confusion by the present antiquated legislation. Then, at a sitting of the Academy of Sciences, Drs. Dujardin-Beaumetz and Bardet having presented a memoir on another coal-tar derivative — orthomethylacetanilide — discovered by M. Brigonnet and by him christened "exalgine," but by them studied clinically and found preferable to antipyrin, Professor Jungfleisch, of the Paris College of Pharmacy, emphatically protested against this and all chemical nicknames. The professor, who is a chemist of considerable authority, urged that, besides the danger of the word becoming the object of a copyright, to use such loose appellations is to go backward to the pristine nomenclature of alchemists with its numberless synonymes. Modern chemical names, he admitted, are—although chemists do their best to shorten them—often very complicated, but they indicate the composition of the substance. It would be a great service to chemists to show them how to still more simplify these names, instead of leading the way to more confusion and possible pharmaceutical errors. He begged all skilful experimenters, and especially his eminent colleague, Dr. Dujardin-Beaumetz, to help professionals to resist so baneful a tendency. In short, Professor Jungfleisch pronounced against "exalgine," in favor of orthomethylacetanilide. To this Dr. Bardet has replied that, since chemists began to introduce in therapeutics compounds with such intricate names, physicians and

pharmacists have found themselves obliged to designate them by a less barbarous assemblage of syllables. It may be less correct, but it is more practical. If Dr. Dujardin-Beaumetz and he have been using the word exalgine (from the Greek words *ex* and *algos*), it is because when they first studied it it was thus presented to them, and its true chemical status was not fixed positively, there being some doubt as to whether it was an ortho-, a meta-, or a para- compound. As to the use of chemical nomenclature, he said, suppose a a physician were to prescribe the following:

℞ Diethylsulphondimethyl-methan, ʒi;
Trichloracetyl hydride, ʒss;
Alcohol, water, etc., q.v.

Admitting that there are physicians able to write such a prescription, how many pharmacists will there be found knowing that the two outlandish names conceal plain sulphonal and chloral? There is no reason why sulphonal should be excluded when chloral is admitted, as are iodoform and chloroform. It is just because chemists have not been able to supply us with current names that we are compelled to invent some ourselves, at the risk of choosing wrong ones. Besides, chemists themselves act likewise. Was not the word chloral used first by a chemist? Physicians cannot pretend to be wiser than chemists, Bayer, for instance, who shortened acetphenethydine to phenacetine, a designation which is scarcely more convenient, and does not show the composition of the substance. Not only are many chemical names impracticable and unintelligible to most members of the healing profession, but they may cause serious mistakes. To-day, for instance, we have ortho-methylacetanilide (for exalgine), but to-morrow one of its isomers—a meta- or para-, etc.—may be found to possess remarkable properties, although quite different. How are pharmacists to find their way in such a maze? As to the copyrighted names, that is a commercial question. The trade-mark can easily be evaded by following the instructions given in the Academy of Medicine resolutions. When a physician prescribes "sublimate," the pharmacist takes the product held in the bottle labelled "mercuric chloride." In the same way, when "antipyrin" is ordered, let him dispense it from his "dimethyloxiquinizine" bottle, and Dr. Knorr will have nothing to say. Only when Dr. Knorr's antipyrin is mentioned is his stuff to be dispensed. Probably the end is not yet, but the controversy is quite lovely as it stands.

It may appear rather late in the day, perhaps, to be now speaking of citrate of bismuth, yet something new is preparing here, which has not been mentioned in the papers so far. French practitioners, as the readers of the THERAPEUTIC GAZETTE probably know, still retain for soluble bismuth compounds some of the old mistrust felt, long since, when bismuth was considered medically as dangerous as lead, if not more so. Consequently, citrate of bismuth is seldom or never prescribed here, unless you prefer to reverse the statement, and say that, citrate of bismuth having never been tried, French physicians are in consequence much afraid of it. When they are told of the doses recklessly administered right and left in America, French practitioners first look incredulous, and when convinced that such is the actual fact, they will at once explain it away by replying that citrate of bismuth on reaching the stomach will be decomposed into an insoluble oxychloride, so that the compound on reaching the economy will, after all, be as harmless as the classic subnitrate. Whatever may be the correctness of this theory,—to most chemists untenable,—it has led some French experimenters to try citrate of bismuth hypodermically, with, it is said, marked results. The effects observed on animals have been such as to suggest the possibility of substituting bismuth for mercury in hypodermic injections for syphilitic diseases. According to private information given to your correspondent, experiments are now in progress at the Lourcine Hospital with soluble citrate of bismuth made after the American formula, and the results will be published when the investigations are completed.

Whether cancer is contagious or not, may be said to remain still a moot question. Dr. Arnaudet, of Cormeilles, in Normandy, has been collecting data which tend to prove that the disease may, under some circumstances, be communicated from one patient to another. In the little village of Cormeilles, with a population of four hundred in 1881, no less than eleven deaths from cancer, out of a total of seventy-four, occurred during the eight years elapsing from 1880 to 1887. So large a proportion for a comparatively infrequent affection is almost equivalent to an epidemic, and was all the more remarkable that the cancers were located in the stomach, neck, or mesentery, and carried off ten mal

patients against one female. As compared with Paris, the whole mortality from this cause was not only considerably larger, but the proportion of sexes entirely different. The usual rate in Paris being fifteen female to nine male cancer patients, the mortality at Cormeilles may be set down at ten times that in the capital, which is considered to present a fair average. The unusual proportion of male deaths in the village is, according to Dr. Arnaudet, owing to the fact that while in the city the uterus is often the seat of the disease, at Cormeilles the cancer almost invariably located in the stomach, and never once in the womb. Other Norman towns, as inquiry from brother physicians proved, showed a similar state of affairs. On grouping together the cases, and comparing the circumstances, too long to be here related, Dr. Arnaudet has come to the conclusion that there is no doubt of the transmission of cancer from one patient to another, and thinks the contagion has, in the present instance, had for a vehicle the water from village ponds used for making cider, the popular drink in Normandy. Cider-drinkers have been shown by medical statistics to be remarkably free from stone and urinary calculi. The immunity would be dearly purchased if cancer in the stomach is to be the price, were it not that Norman peasants can easily escape the dilemma by mixing their cider with none but pure water.

A project is on foot to erect a monument to the memory of Dr. Auzoux, the inventor of the classic models now so well known in teaching medical colleges of America as well as Europe. His discovery of an extremely light and tenacious composition for moulding was the initial point of his work, but only persistent labor and patient investigation enabled him to reproduce living forms so well. Another item of news in connection with departed French physicians is the completion of Dr. Dechambre's "Medical Cyclopædia" ("Dictionnaire Encyclopédique des Sciences Médicales"). The first volume of this immense work, probably the most complete of its kind, appeared in 1859, and the one hundredth and last came out last week. On announcing the fact to the Academy of Medicine and the Academy of Sciences, Professor Verneuil paid a deserved tribute to the memory of his late friend and fellow-academician, and added that American and English subscribers had taken almost as many copies of the "Cyclopædia" as the French did. Dr. Dechambre died in 1886, but, wiser, or luckier, than Dr. Auzoux, left quite a comfortable fortune. While on the subject of current topics, it may interest professional readers on your side of the Atlantic to know that here the number of medical graduates is decreasing, quite the reverse of what occurs with you. According to official statistics, during the session of 1887–88 all the French faculties together conferred only 647 diplomas of doctor of medicine, a beggarly total, which is exceeded by almost any of the large American cities. Of the aggregate, Paris granted 373 diplomas; Bordeaux, 97; Montpellier, 91; Lyons, 48; Lille, 17; and Nancy, 16. This is apparently an increase as compared with the session of 1886–87, when 624 diplomas were conferred, but the contrary is the case, as in 1888 navy doctors, numbering 103, took their diplomas together, while formerly they were by law allowed several years for graduation.

During the Exposition a multiplicity of international congresses are to be held in Paris, and in most of them America will be well represented. Among the American patrons of the Therapeutic Congress, to meet on August 1, we find the names of Professors Wood, Robert Bartholow, and Meade Smith by the side of Drs. Fraser, Holmes, Burney Yeo, Lauder Brunton, and Paul, of Great Britain. The International Congress of Therapeutics, Materia Medica, and Pharmacology, to call it by its full name, might have obtained for the asking a fine hall in the College of Pharmacy, but its organizing committee preferred to hire a meeting-place at the Hôtel des Sociétés Savantes, 28 Rue Serpente. An exhibition of the drugs and natural products—strophanthus and the like—is to be provided in an adjoining room by MM. Adrian and Blondel, probably as a substitute for the extensive materia medica collection of the College of Pharmacy. But, after all, perhaps it was best for therapeutists to eschew both medical and pharmaceutical institutions, and to meet on neutral ground. Only they should not have allowed their reunion to overlap the Chemical Congress, which is to last from July 29 to August 3.

It is almost impossible to resist the temptation of saying something about a most untherapeutical subject,—namely, the Exposition. That it is a success, of course, you know; that it is much backward, you have no doubt been told. But it is hardly possible to imagine the kaleidoscopic variety, brilliancy, and charm of the immense fair. The American sections seem to attract most attentic-

and the largest crowds; and what is most admired is a collection of wax figures of life size representing some of the heroes of the Independence Wars. There the French recognize the old uniforms of their own army. And next to the mock soldiers, they admire most the live "boys in blue" sent by the United States as a compliment to the French republic. These are all fine, good-looking fellows, and for the present their only duty is to show themselves and to keep the public off the unfinished American sections. They smilingly tell you, "On ne passe pas!" in such beautiful French that you try to talk with them in the same language, when you find out that is all they know of the vernacular. But how well they know it! And, lastly, the Eiffel tower, that huge advertising monster, has been useful to sciences by enabling astronomer Janssen to prove—he thinks—that there is no oxygen in the solar atmosphere. Which shows once more that nothing is useless in this wide world.

PARIS, May 22, 1889.

BERLIN.

(From our Special Correspondent.)

For some time past surgery has been taking the lead of all medical sciences. One of its ablest followers aptly compared it with the advance guard of a great army. In its isolated position, during the days of Lister and Langenbeck, it has indeed accomplished wonders. Now, however, it is again returning to the shelter of the main force,—that is to say, surgery is again endeavoring to establish her connection with medicine in general, which during its rapid advance had to some extent been lost. Towards this end the tide of present investigations is carrying surgery, as the observer cannot fail to realize; and this fact is mirrored with special clearness in the results brought forward in the two great congresses held yearly in Germany and Austria, and which, to a great extent, represent the advance internal medicine and surgery have made during the year.

In our last letter we wrote you concerning the discussion which took place in the Congress for Internal Medicine of Wiesbaden, regarding the ileus question, and it now may not be amiss to give you an idea of how the surgeons have been endeavoring to answer this question.

Schede, of Hamburg, the chief of the largest surgical institution in Germany, elucidated at length and in every detail the treatment of ileus, and it was remarkable to note how, in many instances, his ideas coincided with those of his well-known colleague, Curschmann, the former chief of internal medicine in the General Hospital of Hamburg. Both formulated a similar programme, in which the theories of both surgeon and physician touched and showed a common ground where the sister sciences could meet and treat. Also in the Surgical Congress of Berlin, the treatment of ileus formed one of the most interesting themes of one of the sessions. Here one of Von Bergmann's assistants related his experiences and the material gathered in the Berlin Surgical Clinic. Here also an attempt was made to show the striking similarity of the results obtained with those of the clinic for internal medicine.

The surgeon no longer can grasp the knife without first having satisfied himself that the indications for operative interference are more clearly defined than heretofore. The lecturer, Dr. Schlange, divides the complex symptoms which we term ileus into two groups. The first of these includes those symptoms which from the outset have not been adaptable to surgical interference,—these are, first, cases of fæcal accumulation ending in extensive peritonitis, and, secondly, cases of intestinal paralysis arising from a misplacement of the bowels which is caused by ileus, resulting from some internal obstruction. In such cases the so-called "expectative" treatment, as described by Goltdammer in his lecture before the Medical Society of Berlin and also by Curschmann in the Congress for Internal Medicine (see Wiesbaden letter in last number of THERAPEUTIC GAZETTE), is clearly indicated. Laparotomies are justifiable in cases in which a mechanical closure of the bowel is evident. Primarily, however, this must be confirmed by a more exact diagnosis than has heretofore been possible.

To this end we will turn to the consideration of physiological experiments. The latest investigations of the Viennese clinician Nothnagel have brought us an important step forward. Nothnagel experimented upon rabbits, in which he ligatured high as well as low portions of the bowel in different animals, and then through the open abdomen watched the actions of the bowels. He found that the portion of the bowel below the ligature quickly contracted and speedily emptied itself of its contents. The portion above becomes quickly inflated, and peristaltic movements ar

served at intervals; after some time these movements cease. Form and movement are therefore the first important points to be considered in determining a reliable diagnosis. Increased filling of a large portion of the bowel in which occasional peristaltic movements may be recognized are therefore the principal points by the means of which an early diagnosis of intestinal obstruction may be obtained. The plainer one may see, as well as feel, single intestinal loops in the inflated abdomen, the surer one may be of the fact that the bowel has not yet become paralyzed. The paralyzed bowel loses its rounded contour, and the abdomen will assume the typical barrel-form or shape. So long as intestinal paralysis cannot be determined by these symptoms, laparotomy may be performed. Whether or no the operation is indicated in special cases must be determined by differential diagnosis, for, with the science at its present state, in most cases the diagnosis is only a probable one; all the same, there are certain cases in which a positive diagnosis may be reached. The results of these investigations have, however, by no means solved the ileus question, although it cannot be denied that we have progressed one step in the right direction, and also that the combined endeavors of surgeons and internal clinicians are undoubtedly advancing our knowledge of this complex subject.

A second and important province, in which both surgeon and physician can deal mutually and stretch forth a helping hand to each other in order to reach a satisfactory therapeutic result, is that of perforative peritonitis. Here also every surgeon whose operation in such cases has been attended with success must admit that the favorable results obtained must be credited to some unknown factor rather than his own skill, and others, again, must also admit that their surgical interference has only injured a number of cases, and hastened death. Here also we have to deal with a class of cases where a decided restriction must be laid upon surgical procedures, even though the condition of the patient be correctly diagnosed and therapeutic measures based upon purely empiric foundations are not justifiable.

The surgeon, Mikuliez, of Königsberg, who has on many occasions contributed so valuably to surgery, has also given new ideas to the profession which are of great value. He addressed the Surgical Congress on this subject in a most interesting and instructive manner. A new classification of the different forms of peritonitis with reference to their points of origin Mikuliez does not attempt, as at present would be impossible. However, even with the science as it is to-day, we are able to define accurately from another point of view the various forms of the disease. They can be classified in two groups. The one group includes those cases which from the outset are accompanied by a diffusion. This Mikuliez calls *septic-diffused* peritonitis. By many authorities this form is not considered amenable to operative treatment, perhaps unjustly; all the same, it seems almost cruel to subject a patient who is in a dying condition and whose pulse is scarcely detectable to the ordeal of a laparotomy. The second class of cases are of a far more favorable nature. In these the secretion is fibrinous pus, and their characteristic feature is that they do not at once involve the entire, or even a very large portion, of the peritoneum, but progress either slowly or quickly from a certain point. Mikuliez gives this group the name of *putrid-fibrinous progressive* peritonitis. Long ago, however, physicians of internal medicine have endeavored to demonstrate to surgeons that operative interference in such cases only tends to change local peritonitis into general peritonitis. Mikuliez has not been blind to these assertions, but has based his method of treatment upon them. He opens the single points of the disease, which are situated between adhesions, and carefully avoids any tearing of the adhesions. In this manner, in one case, he operated upon six different points of inflammation through three separate abdominal incisions. It is important to abstain from disturbing the intestinal loops which are adherent to each other, and also to handle them as little as possible. It is also of greatest possible importance to most carefully watch the course of the disease in these cases and to have had the patient under close observation for several days, so that no point of disease can be missed at the operation. In cases in which the progress of the disease is not very acute there is no call for undue hurry. In one case, which Mikuliez operated upon in this manner and cured, two weeks elapsed between the first and second incision. One cannot, however, feel confident as to the patient's ultimate recovery until there is no longer any rise of temperature. So long as there is the slightest fever the patient must daily be subjected to a most careful examination, in order to trace the existence of any new points of the disease.

In his discourse Mikuliez also answered several questions relating to abdominal sur-

gery. One was, "Is it necessary to douche the abdomen, and with what should it be done?" In such forms of peritonitis antiseptics take no part; the exudations should be removed mechanically, and for this purpose a half per cent. solution of salt and water is all that is requisite. In irrigating, care should be taken not to use too forcible a stream. A second question is, "Are intestinal sutures necessary or not?" If the point of perforation is immediately found it should be closed by sutures. A long search for the same necessitates an excessive handling of the intestine, and usually results in causing additional trouble. Healing can take place without intestinal sutures. The most practicable method is to pack the incision with tampons of iodoform gauze, a few loose sutures being introduced to prevent any prolapse of the intestine. Great stress is laid upon the after-treatment; opium, strict diet, moist and warm abdominal compresses form a part. If symptoms of ileus continue without their being caused by any existing peritonitis, one should not hesitate to make an artificial anus.

In the debate which followed the reading of Mikuliez's paper, the subject of traumatic peritonitis was also brought forward, but it is not necessary that we should go into this province. We should, however, not forget to tell our American colleagues that the surgeon—König, of Göttingen—spoke of the far greater number of observations which have been made in America on this subject, as well as the vast experience gained there.

We could go on and point out numerous other subjects of discussion and debate which all tended towards the same end, as mentioned in the first part of this letter,—viz., to endeavor to increase the proximity of medicine and surgery. The surgeon Lanenstein lectured to the Congress for Internal Medicine on the subject of stenosis of the pylorus, and caused a lively discussion regarding the internal and operative methods of treatment which the clinician Leyden set forth, and which were highly interesting, especially in reference to his new treatment of contraction of the pylorus. Dr. Mosler, physician of internal medicine, related to the Surgical Congress his experiences with myxœdema, an affection which solicited the greatest interest of the surgeons for the reason that the symptoms of this disease are almost identical with those that have been observed to follow total extirpation of the larynx. The proximity of surgeon and physician in the province of pathology of the brain was clearly demonstrated by Horsley, the English physician, in his address to the Society of German Surgeons.

In short, this endeavor was woven through the entire proceedings of both great Congresses like a red thread, which was caught up at various points, and made secure by research and investigation. The fact opens a new era in the science of medicine and surgery, and may safely prophesy a future of new and efficient therapeutic methods.

IODISM AND SYPHILIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—There is one point in regard to the toleration of the iodides which has not been mentioned in the very interesting discussion upon the question whether a tolerance of iodide is an indication of syphilis. Although Stillé and Maisch, Farquharson, and possibly other writers on therapeutics mention it. I think that many physicians are not aware of the fact that iodism is much more likely to be produced by small doses of the drug than by large. This fact was impressed upon me several years ago, when I had an opportunity to watch the case of a young girl with some obscure cerebral trouble, for which iodide of potassium was thought advisable, although there was no syphilitic history attainable. 10 grains was given three times a day, but it was not borne; the dose was reduced to 5 grains, then to 3, and finally to 1 or 2 grains, but the intolerance persisted. At last she came under the care of another physician, who gave her 30 grains three times a day, which was tolerated perfectly, and from that point the dose was increased without further trouble. During my term of service as physician to out-patients with diseases of the nervous system at the Boston City Hospital, I see three to four hundred patients annually. Taking counsel from this case, for the last four years, when I wished to give iodide in full doses, I have begun with doses of 30 grains, pushing it, of course, to 60, 90, or even 150 grains three times a day. I cannot say in how many cases I have prescribed it, but the cases must be numerous; there have been cases of cerebral and spinal disease, and obscure nervous affections, in some of which there was a clear history of syphilis, and in others no such history could be obtained. The cases must number over a hundred, and in only four or five has

the patient reported any symptoms of iodism. Other patients may have had iodism and never returned to the hospital. One of the cases in which iodism occurred was in private practice,—a man with well-marked tabes dorsalis, who, about a year before his tabes began had a sore, followed by a purplish eruption and sore throat. 30 grains of iodide in this case produced iodism, but the iodide was pushed, and he has since taken 60 grains without coryza or eruption, although his stomach will not tolerate the drug for more than a few weeks at a time.

In hospital patients we are seldom able to exclude syphilis, but I know that I give iodide very often in doses of 30 grains and over, and that the percentage of patients who suffer from iodism is very small. This result may be explained by saying that all the cases which do not suffer are syphilitic, but the percentage is too large, and the statement would have to rest on mere assumption, for no such history can be obtained. Moreover, if all cases tolerating large doses of iodide are syphilitic, how can we explain the intolerance of small doses and the tolerance of large ones by the same patient. The question is hardly capable of mathematical proof, but my own experience has not led me to believe that tolerance of large doses of iodide is an indication of syphilis, and I do believe that iodism rarely follows large doses of the drug, if the initial dose is 30 grains or more.

Yours very truly,

PHILIP COOMBS KNAPP, M.D.

BOSTON, May 10, 1889,
33 MARLBOROUGH STREET.

POISONING WITH CALLA LILY.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—On the 26th I was called at 3.30 P.M. to see the child of J. C., aged 32 months. The history of the case is as follows: Previous to 1 P.M., same day, the child was perfectly healthy. About that time the mother observed the child, walking along the sidewalk in front of the house, chewing the stem of a Calla lily, which one of the neighbors had thrown out. She took it away, and, after giving the child a piece of pie, put it to bed; the child slept until three o'clock, when it woke up with rigors, vomiting, paleness, and subsequently lividity of countenance, convulsive movements, and failure of the circulation. By active stimulation, digitalis, atro- it recovered. This was followed by high fever. The first evacuations of the bowels were normal, but were followed by slimy, tarry evacuations, foul smelling. At this date child still very weak and in critical condition. On the 29th the hips and lower limbs were covered with a papular, dusky, and apparently hemorrhagic eruption. This was ascribed to contact with bowel discharges.

Now, what I wish to know is this, Is the Calla lily a poison? If not, to what are these violent and sudden symptoms to be ascribed? My diagnosis was poisoning by the Calla lily. Some of the local medical "Dogberrys" have been inclined to sneer at it.

Very truly yours,

F. C. CLUXTON, M.D.

BRADFORD, MCKEAN CO., PA.

[The editors of the THERAPEUTIC GAZETTE are not aware of any recorded case of poisoning by the so-called Calla lily; on the other hand, the plant belongs to the family Araceæ, many species of which contain acrid poisonous juices, and it is, therefore, very probable that the plant is poisonous. The symptoms detailed by Dr. Cluxton are quite extraordinary, especially in the occurrence of the hemorrhagic eruption, and give the case the aspect of having been produced by some food or other organic substance which had undergone partial decomposition, with the formation of ptomaïnes or allied principles.—EDS. THERAPEUTIC GAZETTE.]

HEMORRHAGE FROM SALICYLIC ACID.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the March number of the GAZETTE I find an article upon "Hemorrhage from Salicylic Acid," with a request for notes of similar experiences.

The treatment of acute articular rheumatism by the use of salicylate of sodium, when occurring in robust patients, has given such uniformly good results in this hospital that it has come to be almost a routine.

The drug is usually exhibited in doses of gr. x every hour until the temperature falls and the joint symptoms begin to show marked improvement, or until some of the physiological symptoms appear. In a few cases it has been given in doses of gr. xx every hour for a period of ten hours. The gr. x doses are often continued for three days, day and night, without producing deafness or tinnitus aurium.

From a hasty glance over our histories I

should say that at least thirty per cent. of all such cases have epistaxis on the second or third day. This has never been severe except in one case, and the dosage is immediately reduced on its occurrence. In no case, except the one noted above, has the tinnitus, or any other toxic symptom, preceded the epistaxis. Epistaxis is the only form of hemorrhage that has been noted.

The one exception noted was H. S., a German, æt. 23. His joint symptoms were not particularly severe, and his constitution was not as robust as usual in those cases treated with the salicylates. The dosage was gr. x each hour for eighteen hours. At about the twelfth hour he had a slight epistaxis, which he did not report to the nurse in charge. Just before the last dose he complained that his ears were ringing. Shortly afterwards he had a furious attack of epistaxis and became violently delirious. His pulse was irregular and slow, but temperature was 103. His delirium was of the melancholic type. Hemorrhage was so severe that plugging of the nares was necessary. Delirium continued all night. Profuse perspiration over the whole body. Repeated fresh attacks of epistaxis, and continued high temperature for twenty-four hours. Patient was somewhat prostrated, but ultimately made a good recovery.

Our dosage may be more heroic than is usually attempted, but certain it is that the results are very satisfactory. The majority of severe cases, if of not more than two weeks' standing when admitted, show total disappearance of joint symptoms within a week.

HERBERT W. CARDWELL,
Senior Interne.
METHODIST EPISCOPAL HOSPITAL,
BROOKLYN, N. Y., May 19, 1889.

TREATMENT OF YELLOW FEVER.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—Dr. Sternberg, in his paper, published in the May number of your journal, on the "Treatment of Yellow Fever," on page 301, mentions Dr. Cleary, of Rio de Janeiro (*whose first name is not Robert, as printed, but* REUBEN), as having adopted his method. As I have a letter from Dr. Reuben Cleary, dated Rio de Janeiro, April 1, 1889, relating to yellow fever there in general, and Dr. Sternberg's treatment in particular, I have copied a few extracts from the same which I inclose for publication, if deemed of sufficient interest to your readers by you.

With great respect, yours,
J. T. HOWARD.

WASHINGTON, D.C., May 25, 1889,
No. 1126 NINTH STREET N. W.

RIO DE JANEIRO, BRAZIL, S. A.,
April 1, 1889.

". . . We have passed (and are still passing) through one of the most horrible seasons which ever afflicted Rio; the death-rate reached one hundred and sixty-seven in one day, while the normal number averaged some twenty-eight to thirty. As many as fifty-one fell dead in the streets, or died in a few hours after falling, in one day. The funerals were passing my door *at a gallop* all day long and until one or two o'clock in the morning, and workmen to prepare coffins could not be found in sufficient numbers, nor even men to carry them to the houses of the dead. The authorities seemed to be paralyzed, and in my opinion are directly responsible for this state of things, because of the excessive and long-continued heat, and absolute want of rain, the water-supply was insufficient, so much so that in many streets not one drop was to be had except that brought from the suburbs in carts. Rev. Mr. Jarloux told me he had spent seventy-five cents one day buying water. *After* the rains commenced, on the 21st of March, the authorities had an immense supply of water introduced in six days from the mountain-streams near town (which all the time could have supplied a sufficiency), instead of doing so at the beginning of the season, since when the heat is not so great and the death-rate is reduced one-half; still it is fearfully high. There were many cases of 'heat excess,' and just such yellow fever as they had in Memphis once, killing in a few hours, which appeared not to be well understood here; they called it *accesso pernicioso* (pernicious attack).

"Besides other malignant diseases, I have had thirty-four cases of yellow fever (genuine), of which thirty-three are up and walking about; one poor girl died. . . . There was no water to wash out the public drains, which were foul and stinking; . . . and when the rain came and flooded them, the outpouring blackened the water of the bay for miles. . . . When I had the yellow fever last year, in spite of the wishes of my attending physicians, I took large doses of bicarbonate of sodium against the excessive acidity, which

ing vomits and killing me, they saying that acid kills the microbe. Now, Dr. Sternberg's experiments prove that in yellow fever the whole alimentary canal is filled with highly acid matters, hence he recommends alkalies as a germicide. I always use his formula (modified), as my experience proves that alkalies help to preserve the flow of urine, lessens the albumen, and calms the stomach, though I do not neglect my regular treatment. His (Dr. Sternberg's) formula, modified, is:

℞ Bichlor. hydrarg., .03;
Bicarb. sodii, 10;
Aq. pura, 1000. M.

Sig.—Dose, 2 large tablespoonfuls every hour *ice-cold*.

"Many of my sick had black vomit, all albuminous urine with slight suspension, and some were in a state of collapse, so that I filled them with brandy and gave hypodermic injections of ether. For suppression of the urine I have used hypodermic injections of caffeine at intervals of one hour, and every time succeeded in re-establishing the flow in four hours."

TREATMENT OF PHTHISIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I noticed in the April number of the THERAPEUTIC GAZETTE that Miguel and Rueff have used inhalations of mercury in the *treatment* of *phthisis* with good results. I also have used mercury by inhalation in the *treatment* of *phthisis* during the past two years, with good results. I have reported several cures to the medical society, and intended to have it reported by a journal, but waited to see how long my cases remained well.

So far the treatment has been successful. One case has been under my observation for two years without any return of the symptoms. I would like you to give my treatment a small space in your valuable journal.

The best hygienic soundings that can be had will aid very materially in recovery. It is hardly necessary to say anything about nourishment, as so much has already been written on that subject.

I give the following prescriptions:

℞ Hydrarg. bichl. corros., gr. i;
Sat. sol. of acid boracis, ℥vi. M.

Sig.—To be used three times per day in steam-atomizer for five minutes.

℞ Chloral hydrate, ʒiv;
Div. in chart. No. 2.

Sig.—Dissolve one powder in glass of water and add ℥i of alcohol. Sponge patients twice a day.

Under this treatment the night-sweats stop, the temperature becomes normal, chills stop, and the patient gains weight. After the patient is able to get around and the temperature becomes normal, stop the sponging, and use the inhalation twice daily.

In closing, Mr. Editor, I hope many who read your valuable journal will give this treatment a fair trial and report.

I remain, yours respectfully,

O. H. PRESBY.

1360 LEXINGTON AVENUE, NEW YORK,
May 6, 1889.

HYPODERMIC INJECTION OF LACTATE OF QUININE.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the April number of the THERAPEUTIC GAZETTE is an article on the hypodermic employment of lactate of quinine, and directions are given for the preparation of the salt and its solution.

The following formula gives, practically, the same results, minus the bother of precipitating the quinine, etc.:

℞ Quininæ sulph., gr. xx;
Ac. lactis, ♏xx;
Aquæ dest., q.s. ad m. c. M.
Sig.—♏v = gr. i quininæ.

This I have used a number of times, giving ♏xx at a puncture, and have never had any unpleasant local effects, except only in one instance, and then only a slight tenderness for a day or two. For the convenience of both doctor and druggist, the above formula is worth remembering.

Yours, etc.,

CHARLES M. SELTZER.

PHILADELPHIA, May 30, 1889,
608 NORTH SEVENTEENTH STREET.

THE DOSE OF GELSEMIUM SEMPERVIRENS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the THERAPEUTIC GAZETTE for November 15, 1888, a writer speaks of giving "one good large dose of the fluid extract of gelsemium, say 15 to 25 minims," for acute nasal catarrh. From my experience with this drug I should consider the dose an unsafe one. I have seen one patient in whom 5-drop doses of a fluid extract of gelsemium produced alarming toxic symptoms (*Phila. Med. Times*, January 5, 1878). The patient had been

taking the remedy for about two weeks,—5 drops three times a day,—and had taken in all one fluidrachm of the fluid extract. In another case, a dose of 7 drops caused visual disturbance and unsteadiness of gait. I should be glad to have your opinion as to the proper dose of the preparation.

Yours, etc.,

WHARTON SINKLER.

PHILADELPHIA, May 26, 1889,
1534 PINE STREET.

[15 minims of fluid extract of gelsemium is certainly an unsafe dose for ordinary use.—EDS. THERAPEUTIC GAZETTE.]

Notes and Queries.

TUBERCULOSIS OF THE PERITONEUM.

From material consisting of twenty-five fatal cases of tubercle in which the peritoneum was either primarily affected, or in which it had been affected for a long period, DR. HEINTZE deduces some interesting facts, which he publishes in the form of an inaugural dissertation. All the cases occurred in the Breslau clinic, and necropsies were made in every instance, so that there was no doubt about the diagnosis. He divides the cases into three groups. 1. Those where there was a copious fluid effusion. Here the clinical symptoms bore considerable resemblance to those met with in cases of ascites from congestion. From this condition they were distinguishable by the very large amount of albumen contained in the fluid drawn off on tapping. No tubercle-bacilli, however, seem to have been found. After the distention had been relieved by the removal of the fluid, the thickened peritoneum could frequently be felt, and peritoneal friction could be detected. These effusion cases formed the most numerous of the three groups. 2. The plastic form, producing a coating or tumor-like bodies. The pseudo-tumors formed by the exuded plastic matter could generally be distinguished from real tumors by the ill-defined character of their edges. This group comprised nine of the twenty-five cases, and in five of them there were tumors of considerable size. In these plastic inflammations there is generally a good deal more pain than when there is much fluid effusion; there is a tendency, too, to the formation of kinks in the gut and bands, which cause obstruction, so that fæcal accumulations and ileus are not uncommon. 3. The latent form, where there is neither any great amount of effusion nor much plastic exudation. These are the cases which used to be classed as tuberculosis of the peritoneum, in contradistinction to those in which the inflammatory symptoms were more prominent, which were denominated tubercular peritonitis,—a distinction which Dr. Heintze thinks is unsatisfactory. One remarkable point is mentioned in the dissertation,—viz., the frequency with which tubercular disease of the peritoneum is associated with cirrhosis of the liver. This was found in seven of the twenty-five cases. Pleurisy was found twenty times, and signs of scurvy twice. In many cases there were long remissions, so the prognosis is not necessarily quite so grave as it is usually supposed to be. The patients died mostly from general tuberculosis, very rarely from perforating peritonitis or from tubercular peritonitis. Most of the cases occurred in the male sex, frequently among men addicted to drink. In three instances an injury to the abdomen had preceded the commencement of the symptoms. As to operative measures, the only good that can usually be done is to empty the peritoneal cavity, so as to free the vessels from the pressure of the ascitic fluid; paracentesis only accomplishes this imperfectly. In the plastic form, operative measures are, as a rule, useless, it being impossible to remove all the diseased matter as can be done in tubercular disease of bones or joints; still there are circumstances under which an operation may be imperatively called for, as, for example, where ileus is produced by the formation of constricting bands. Dr. Heintze does not think any advantage is to be expected from opening the abdomen and dusting the viscera with iodoform.—*Lancet*, April 6, 1889.

THE IDENTIFICATION OF CERTAIN NEW REMEDIES.

The new remedies antipyrin, antifebrin, phenacetin, salol, sulphonal, and urethan, when compressed into tabloids, cannot, on account of their similarity of form and color, easily be distinguished from one another by simple inspection. The following test, proposed by A. PERCY SMITH in the *Pharmaceutical Record* for April 1, 1889, will, however, be found sufficient for identification of the drug, should the label on the bottle by any accident be defaced or removed:

	One 5-gr. tabloid + 3i HNO_3.		Diluted with 3ss water.
	Cold.	Hot.	
Antipyrin	Liquid turns yellowish.	Violent action; tabloid turns deep red and dissolves to red liquid.	Turbid purple liquid; deposits on standing.
Antifebrin	Nil.	Violent action; liquid turns orange.	Yellow-orange solution, growing turbid as it cools.
Phenacetin	Tabloid and liquid both turn yellow.	Violent action; yellow liquid; on cooling becomes solid by separation of crystals of trinitrophenol.	Partial solution of crystals.
Salol	Very faint violet tint; tabloid melts on slightly warming.	Strong action; orange liquid; crystals separate on cooling and float to surface.	Pale yellow liquid; white floating crystalline mass.
Sulphonal	Liquid slightly yellow.	Tabloid dissolves to a clear yellow solution.	Colorless; deposits white crystals on standing.
Urethan	Dissolves easily.	No change.	No change.
Sulphonal, Phenacetin	+ a drop of solution of ferric salt.		= slight stain.
Antipyrin	+ a drop of solution of ferric salt.		= deep blood-red color.

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,
WASHINGTON, D. C., May 1, 1889.

TO THE MEDICAL PROFESSION:

The various medical associations and the medical profession will be glad to learn that DR. JOHN S. BILLINGS, Surgeon United States Army, has consented to take charge of the Report on the Mortality and Vital Statistics of the United States as returned by the Eleventh Census.

As the United States has no system of registration of vital statistics, such as is relied upon by other civilized nations for the purpose of ascertaining the actual movement of population, our census affords the only opportunity of obtaining near an approximate estimate of the birth- and death-rates of much the larger part of the country, which is entirely unprovided with any satisfactory system of State and municipal registration.

In view of this, the Census Office, during the month of May this year, will issue to the medical profession throughout the country "Physician's Registers" for the purpose of obtaining more accurate returns of deaths than it is possible for the enumerators to

earnestly hoped that physicians in every part of the country will co-operate with the Census Office in this important work. The record should be kept from June 1, 1889, to May 31, 1890. Nearly 26,000 of these registration books were filled up and returned to the office in 1880, and nearly all of them used for statistical purposes. It is hoped that double that number will be obtained for the Eleventh Census.

Physicians not receiving Registers can obtain them by sending their names and addresses to the Census Office, and, with the Register, an official envelope which requires no stamp will be provided for their return to Washington.

If all medical and surgical practitioners throughout the country will lend their aid, the mortality and vital statistics of the Eleventh Census will be more comprehensive and complete than they have ever been. Every physician should take a personal pride in having this report as full and accurate as it is possible to make it.

It is hereby promised that all information obtained through this source shall be held strictly confidential.

ROBERT P. PORTER,
Superintendent of Census.

"PROCURSIVE" EPILEPSY.

This term is in far more common use among the French than with us. It signifies an attack the chief feature of which is a propulsion of the body in some special direction; it is apparently not accompanied by actual loss of consciousness, or followed by coma; its duration does not exceed that of an ordinary epileptic fit; according to Bourneville and Bricon, it is attended with marked congestion of the face. These cases are known to be epileptic by their associations as well as by the character of the attacks, the element of suddenness being very marked. In the same individual they may be replaced by epileptic fits, or they may replace a true epilepsy with loss of consciousness. There is, indeed, nothing so very remarkable in their occurrence if they be regarded from a physiological stand-point. They are the equivalents of head-banging and head-shaking in infants and children. The actual kind of movement varies much in different cases,—in some a rapid revolving of the body around its horizontal axis, in others a rotation in a large circle, and in others a movement recalling that performed by some clowns. The highest expression of consciousness—if this be perfect control over volitional efforts—is evidently lost, since the patient cannot prevent himself from performing these absurd antics.—*Lancet*, May 11, 1889.

THE TREATMENT OF ANEURISM.

DR. AURELIO MUTIS, of Bogotá, publishes, in the *Revista Médica* of that city, an account of a case of abdominal aneurism occurring in a patient of 37 years of age, which he successfully treated according to the method adopted by Huchard in Paris and by Balfour and Duckworth in this country,—viz., complete rest in the recumbent posture, combined with large and long-continued doses of iodide of potassium or sodium. The treatment was commenced on June 1, 1887, the daily quantity of iodide of potassium ordered being sixty grains. A soap-and-water enema was given every morning, and no sitting up permitted. Liquid food also was prohibited as far as possible. Within two months the cough, which had been the most distressing symptom, entirely disappeared; at the end of three months the pain had also vanished, and the tumor, which had formerly existed at a spot a hand's breadth below the xiphoid cartilage, and which had been as large as an orange and markedly pulsatile, had very perceptibly diminished in size, the pulsations also had decreased in amplitude. The iodide of sodium was now substituted for that of potassium. At the end of six months, the tumor and all the symptoms due to it having entirely disappeared, the patient was allowed to get up and to move cautiously about the room. In a short time he was able to go out, and during all last year he carried on his business as usual, and has remained quite free from all symptoms of the disease up to the present time.—*Lancet*, May 18, 1889.

CINCHONIDINE AND EPILEPSY.

It has been known for a long time that cinchonidine, one of the alkaloids of the cinchona bark, possesses the power of producing epileptic convulsions. Professor Chirore, in Padua, assumes, from his experiments made on pigeons, in which this alkaloid was incapable of producing convulsions after ablation of the cerebral hemispheres, that cinchonidine owes this property to its action on the motor cerebral zone. Albertoni, on the other hand, notes that in pigeons, as well as in dogs, even after ablation of the corresponding motor zones, cinchonidine still was capable of producing convulsions, and from the results of his experiments he concluded that epilepsy has its starting-point not in the cortex, but in the mid-brain and medulla oblongata. In this state of the question, DRS. LUSSANA and GALLERANI reported a number of further experiments which they had made before the Societa Medico-Chirurgica in Bologna (*Internationale Klinische Rundschau*, May 12 1889). They found that after extirpation of the motor zones in no case was injection of this alkaloid capable of immediately producing epileptic convulsions, but that the convulsions occurred a short time after the operation, when the irritative influence of the operation had passed off. The authors, therefore, believe, from their results, that they can confirm the conclusions of Albertoni that in addition to the cerebral cortex, epileptic convulsions may have their starting-point both in the mesencephalon and medulla oblongata.

—THE—

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Original Communications.

*PROPHYLACTIC HYGIENE.**

By Professor Dujardin-Beaumetz, Paris, France.†

LECTURE XI.—ON THE PROMOTION OF PROPHYLACTIC HYGIENE BY LEGISLATION.

By Dr. A. J. Martin.

SANITARY LEGISLATION IN THE UNITED STATES.

By E. P. Hurd, M.D.

THE last lecture of the series on Prophylactic Hygiene was delivered in Cochin Hospital by Dr. A. J. Martin. It was thought best to reproduce this lecture, as being the final lecture of the course, and as containing considerable matter which will be of especial interest to American readers, when presented in contrast with the superior sanitary systems which prevail in the United States. In accordance with the wish of Dujardin-Beaumetz, the translator has endeavored to give briefly the main features of the health organizations of the United States.]

SANITARY LEGISLATION IN FRANCE.

The various prophylactic measures which Dr. Dujardin-Beaumetz has set forth in his course of lectures ought, in order to be properly enforced, to find their sanction in a certain number of legal and administrative provisions. It is the sum of these provisions which constitutes sanitary legislation, the end of which is to preserve and maintain the public health.

In fact, if government can exercise but an

* Advance sheets of a lecture delivered in Cochin Hospital, and translated for this journal by E. P. Hurd, M.D.

† Member of the Academy of Medicine, Physician to Cochin Hospital, etc., Paris, France.

indirect action on some of the causes of disease or insalubrity, if often it must limit itself to providing, through proper experts, instruction in the principles of sound hygiene under all its forms, there will be cases where direct interference will be demanded,—as, especially, where the insalubrity depends on a known external cause.

No one has power of himself to compel of his neighbor the suppression of an infectious pool or of a heap of pestilential garbage, or the isolation of a patient affected with a transmissible disease. No one can undertake of himself to contend against the dangers threatened by the insalubrity of a city which has neither sewers nor good drinking-water, and force the municipal authorities to make it healthy. Measures of sanitation imply a constraint with regard to private individuals or the local powers, and it belongs to the public authority to enforce the needed compulsion.

If it be a matter of insuring the wholesomeness of all the products which make part of the daily food of the people, it is by special restrictions with regard to the liberty of commerce that it is necessary to proceed; and, among the agencies put forth for this end, we may enumerate inspection by state officials, heavy penalties imposed for violation of sanitary requirements, the confiscation and destruction of objects spoiled or adulterated, or otherwise injurious to the health of the consumer. Here, it is necessary to protect the health of children against the neglect of selfish nurses, or against the inhumanity of parents, who, for purposes of gain, put their offspring at too young an age into workshops, factories, or other manufacturing establishments, and thus prematurely stunt the brain-development and exhaust the forces. There, it is against the invasion of contagious diseases that it becomes necessary to protect the community, and all the prophylactic agencies mentioned in the previous lectures of this course need to be called into exercise and enforced by the government. There must be official information of cases noted, isolation, as far as this is possible, disinfection under all its forms, preventive vaccination for smallpox and perhaps rabies.

It belongs without doubt to each individual of a community to take of his own accord the precautions which he deems necessary against the invasion and propagation of transmissible diseases. It is incumbent on each one to sequestrate himself from the numerous causes of ill-health in the environment where he lives. This is, however, a matter of private duty, which, before it can have the extension which is desirable, must await the progress of good morals, right habits of living, and intelligence. Hence, no one has ever pretended that in a great number of circumstances the public authorities—as the law certainly confers on them the right—have not also the duty to supplement efforts made by the citizens themselves in the direction of prophylactic hygiene. It is dangerous to intrust such responsibilities to citizens simply, or to the combined efforts of a number of citizens, for these efforts will be too often dilatory and feeble. Let the municipal supervision be thorough and impartial, let the ruling authorities have in such matters a responsibility and control sufficient to scrupulously and completely protect the public interests, and the results will show to the satisfaction of everybody that if prophylaxis in its essence belongs to the individual as a part of his duty to himself and the society in which he lives, it also belongs in an important sense to the representatives of the people, who ought to be directed in their efforts to promote sanitary welfare by the highest wisdom of the age.

Such are the principles which seem to us to justify every kind of sanitary legislation. Let us now see how they are applied in France, and what are the nature and extent of the powers conferred on the administrative authorities in matters of prophylactic hygiene.

Sanitary legislation in France includes a certain number of laws and decrees, and a body of regulations, with specifications of the proper authorities for their enforcement, and the discretionary powers which these are to possess.

Some of these legislative provisions require the co-operation of all the ruling powers of the country (local and general governments); others are left to the discretion of the local authorities. Lastly, there are regulations which touch at the very root of our social organization.

In a general manner it may be said that it is to the municipal authorities that the care of the public health is confided in France. The rights and prerogatives of the municipal organization include the provisions essential for this end. Moreover, a special law regarding unhealthy habitations confers particular powers on the municipal councils, and the law pertaining to the protection of infants authorizes the departments to adopt rigorous

measures as to everything that concerns the hygiene of early life. To the state, on the other hand, is reserved more directly the sanitary police management of cholera epidemics and that of epizootic diseases, the works in general of sanitation and public salubrity, the care of public institutions, the supervision of articles of food. Lastly, certain provisions of the codes are directly applicable to the public health.

We shall not be able here to examine in detail all this legislation, to which voluminous works have been devoted. It will suffice to indicate the most essential parts, and to inquire if it gives satisfaction to the legitimate exigencies of the public health, while protecting as far as possible private interests.

In France the basis of sanitary legislation is to be found in the powers which the municipal authority since the Revolution has possessed with regard to matters of public hygiene. The mayor is the principal agent in the execution of sanitary regulations; the prefects have also the obligation to enforce these in their respective departments, but their action is in a certain measure trammelled and limited by the local authorities. The Article 97 of our last municipal law (April 5, 1884) reproduces the provisions inserted for this end in the laws which have been successively elaborated on this subject since 1789 and 1790. I here quote the following passage:

"The municipal police has for its object to insure the good order, safety, and health of the public. The duties of this branch of government consist, notably, in the care of preventing by suitable precautions and of suppressing by all possible means all such public calamities as epidemic and contagious diseases, in providing for the needs of the suffering, and, if occasion may demand it, in summoning the aid of the higher executive authorities."

Hence the municipal authority is under obligation to superintend with the greatest care all matters pertaining to the salubrity of the commune; it cannot completely accomplish this without imposing restrictions on the use of private property. And here we have a plain rule that, if a proprietor is at liberty to do what he pleases at home, he has no right to perform any act which may have *exterior* consequences injurious to the public health; in the enforcement of this principle, the municipal authority may legally interfere.

But the mayor possesses no power which enables him to be the judge of the *means* for attaining the end which the law thus assigns to his intervention in matters of prophylactic hygiene, and he cannot of himself initiate any measure which may involve the finances of the commune (as by the levying of special taxation), even in cases of absolute urgency. Such are the restrictions which law and jurisprudence impose on his powers, and these restrictions are still further increased by the fact that it is never in his power to order any *exclusive* means for the suppression of the cause of the insalubrity.

During the course of the last few years, since the cholera epidemic of 1884, public attention has been more earnestly directed to these matters. Two important legal decisions have shown how restricted is our civil jurisprudence in everything pertaining to sanitary regulations.

In regard to the first of these decisions, the mayor of the city of Caen, on September 27, 1884, with the advice and authority of the Commission of Hygiene, ordered the suppression of a cesspool situated in a court contiguous to several dwelling-houses. The stench which arose from matters there undergoing putrefaction rendered living in the vicinity almost intolerable, and it was plain that the infiltrations from this cesspool were liable to contaminate the subterranean water-sources on which the inhabitants of that quarter depended for their supply of drinking-water. The proprietor appealed from the mayor's order, and the Court of Appeals ruled, July 25, 1885, that the suppression of this cesspool as the exclusive means of abating the nuisance, as long as there might be other means quite as efficacious and less costly to the proprietor, constituted an outrage against the right of property, and an overstepping of the power belonging to a mayor, these officers not being authorized to determine for themselves the nature and importance of undertakings designed for the promotion of the public health.

The second decision pertained to an act of the mayor of Toulon, who, during an epidemic of smallpox, ordered certain houses in which cases of this disease had occurred to be whitewashed inside. One of the citizens to whom this order applied refused to allow his house to be whitewashed. He appealed first to the police tribunal, which ratified the decree of the mayor. Then he carried the matter to the Court of Appeals, which decided that a municipal officer exceeds his prerogatives when he prescribes measures of sanitation

under such conditions. He cannot indicate an exclusive means of prophylactic hygiene when there may exist other means capable of attaining the same result. At the same time, the Manual of Dalloz contains this just remark relative to this point: "To confer on the municipal officer the right to take precautions suitable for preventing epidemics is evidently to make him judge of the means to accomplish this end. How can this official fulfil the important trust assigned to him if he is obliged to adopt all the ways and methods suggested by private citizens, and if he has not the right to prescribe the means which his wider knowledge and the experience of the best sanitary authorities have shown to be most efficacious?"

The same remark is applicable to the powers conferred upon prefects by virtue of Article 98 of the municipal law of April 5, 1884. This law maintains their right to make general regulations in regard to the following matters: Safety, salubrity, tranquillity, and nothing more; it permits them to make less general regulations applicable to a group of communes without previous requisition addressed to the mayors. Moreover, it authorizes the prefects to interfere when a mayor, after due notice, neglects to do his duty in enforcing any measures which the maintenance of the health, safety, and tranquillity of the public may demand. But the prefect has not the right to take such authority into his own hands, except within the limits which are assigned to the powers of the mayor,—*i.e.*, he can only act where the latter acts,—and he is subject to the same limitations. He has not the right to indicate any particular means of prophylactic hygiene in a given case, and he cannot put upon the commune any expense without the authorization of the municipal council. For the expenses of hygiene are not included by the law among those which are obligatory; so that the decrees of mayors in matters of this kind can only be couched in general terms, and cannot entail any costs to be put to the account of any one of the departments without the consent of the elective boards. Whence it follows that all measures which do not enter into these categories may be prescribed by the mayors or by the prefects in default of these officers. Thus, the declaration of diseases may be required by them of physicians; they may even order general vaccination throughout their commune, isolation, disinfection, etc., provided they do not render obligatory any means for executing these provisions. But thus far mayors and prefects have given little evidence of anything but pusillanimity and ignorance, even when they have been acting with the best intentions. Not a mayor has dared to assume much responsibility in matters of prophylaxis, however desirable prompt and decisive action might have been, nor has the civil government yet deemed it worth the while to come to the aid of the municipality in accordance with the spirit and intent of Article 97 of the municipal law.

When France first became seriously alarmed by the dangers which attended the importation of the exotic pestilential diseases,—*i.e.*, yellow fever, cholera, and the plague,—the government came to a realization of the fact that the then existing legislation was notoriously insufficient; so a special law was passed to meet the exigencies caused by these scourges, and limited solely to them. This is the law of March 3, 1822, the only law of sanitary police applicable to man which France possesses. In accordance with the provisions of this law, the government fixes by ordinances,—1, the countries whose products should be subjected to sanitary regulations; 2, the measures to be observed on the coasts, in the harbors and roads, in lodging-houses, and all suspected places; 3, the extraordinary measures which the invasion, or the fear of a pestilential disease, renders necessary on the frontiers or in the interior. It regulates the constitution, the prerogatives, and the jurisdiction of the authorities charged with the execution of these measures, and delegates to them the power of applying provisionally in cases of urgency the sanitary *régime* to portions of the territory which might be unexpectedly menaced.

The terms of this law, it will be seen, are very general, and give to the public authorities almost unlimited powers in cases of cholera, plague, or yellow fever, but only in such cases. The prescriptions of the sanitary police—*i.e.*, the aggregate of the sanitary regulations of the maritime police—may become then applicable to the whole or a part of the territory, if it has been invaded by the pestilence. The penalties which this law inflicts are very grave,—from a year in jail and a fine, to banishment, forced labors, and even death for all who evade the sanitary ordinances, make lying declarations, or neglect to give necessary information to the authorities.

These penalties, in many respects excessive, indicate the terror which these partic

lar diseases engender in the public mind. The law of March 3, 1822, in fact, gives the municipal authorities full power in such cases to execute all the sanitary measures indicated in the previous lectures of this course, and we might well ask why such legislation should be adapted only to diseases relatively rare in our country, and not to those which are continually ravaging our populations, and for which the same prophylactic measures are quite as efficacious?

Whatever theory one may entertain regarding the pathogeny and etiology of transmissible diseases, it is universally admitted that these diseases have very close relationship with the unhealthy state of the environment in which they make their appearance, just as the human organism on which they commit their ravages is influenced for good or ill by the salubrity or unhealthfulness of the environment in which it lives. Hence the necessity of insuring the healthfulness of inhabited districts and houses.

A state law of 1807 prescribes in its Article 35 that all works of sanitation which concern cities and communes shall be ordered by the government and the expenses charged to the interested communes. This principle is fair and reasonable. It is proper and just that the state should be invoked to interfere in opposition to private interests, to the selfishness or inertia of individuals and corporations, and prevent a focus of insalubrity from becoming a danger to the entire community, and that those proprietors who are to profit the most by sanitary works should be taxed therefor in proportion to the benefits received; but, practically, these legal provisions are attended with so many difficulties in their execution, and sanitary enterprises are so little to the national taste, that the law has almost been a dead letter. This has been to a considerable extent the case with regard to legislation to protect our water-sources, whose pollution by the sewerage of cities and the refuse of industrial establishments is so frequent. The act of 1810 is notoriously insufficient. . . .

It remains to examine into the sanitary legislation applicable to dwelling-houses. The law should take cognizance of and promptly suppress all agencies which oppose the salubrity of habitations, and all citizens should be compelled under heavy penalties to interest themselves in maintaining the proper hygiene of their premises. The law of April 13, 1850, applies only to unhealthy lodgings and out-buildings, let or occupied by persons other than the proprietor, usufructuary or commoner, and gives too much liberty to the tenant within the precincts of his home. According to the Speaker of the legislative assembly, M. de Riancey, "when the proprietor himself occupies his house, the law lets him alone,—he is absolutely free; if he wishes to injure himself, the law cannot prevent it." This liberty of suicide, as it has been called, cannot but breed disrespect and license. It is a recognized fact that the proprietor who lives in an unhealthy habitation may injure others besides himself,—his family, his employés, his servants, and his neighbors, and all have equally the right of protection from the public authority. No one has the right to have in his dwelling-house a centre of infection. In this connection it is interesting to notice that those people who have been the greatest advocates of individual liberty have been the most ready to promulgate laws restrictive of personal liberty.

[Allusion was made to the abuse of privilege on the part of tenants, who are often allowed by proprietors to keep their houses in a filthy, slovenly state, and even make them foci of contagion. In cases of this kind the law recognizes only the proprietor, who may be called to account when the premises are judged a nuisance, and be compelled to cleanse the house or otherwise abate the nuisance. By the law of April 13, 1850, all dwelling-houses are termed "unhealthy" which are shown to be in a state dangerous to the life or health of the inhabitants. But this law fails to define with any degree of precision what are to be understood as causes of insalubrity. Hence there is constant difficulty in obtaining a satisfactory judgment in cases of complaint made to the municipal courts, the prefect of the police, or the State Council. This has been exemplified on occasions when an attempt has been made to obtain legal decrees compelling certain proprietors to furnish good potable water to their tenants. Several decisions have shown either the pig-headedness of the authorities or the inadequacy of the laws.]

Such are the principal points of French sanitary legislation in regard to matters pertaining to the prophylaxis of epidemic and transmissible diseases, and the rendering healthy of places when these communicable diseases have occurred. This legislation is at once too narrow and too general. Too general, in that it does not define the powers of the administration, while theoretically it seems to accord them considerable, even ab-

solute, dictatorial authority. Too narrow, since in practice these powers are generally without effect by reason of the impediments and limitations by which they are surrounded. The health officials have the right to prescribe all proper measures of prophylactic hygiene, but they are not allowed to specify the means of execution, and the money for carrying out these measures, however urgent they may be, can rarely be obtained without considerable vexatious delay. They are able, in principle, to insure sanitation, but only after formalities without number and without precise rules.

Hence the necessity of a revision of our legislation is imperiously felt, by reason, especially, of the progress which prophylactic hygiene has made in the last few years; there is need that the intelligent supervision and care of the public health should be a reality, and should be aided, not hindered, by the law, and that prophylaxis should immediately follow the communicated information of the disease. Sanitary expenses should be included among the expenses that are made obligatory, and when contagious diseases appear in a community, physicians and all other persons who have knowledge of such diseases should be compelled to report them instantly to the proper health officers. Moreover, the law ought to indicate, among measures to be taken for the sanitation of habitations, those which are urgent and those which may be deferred. In cases of the first kind, when the urgency has been affirmed by a proper board or commission,—*i.e.*, in a time of epidemic, flood, fire, etc.,—when the immediate safety of the inhabitants is concerned, there should be no delay in carrying out the provisions of the board or council.

[M. Martin concludes by alluding to the results achieved by boards of health in other countries, which ought, he said, to inspire his own countrymen to more public spirit and enthusiasm in the promotion of undertakings designed to protect the people from the causes of disease.]

SANITARY LEGISLATION AND BOARDS OF HEALTH IN THE UNITED STATES.

From the foregoing exposition, it will be seen that sanitary legislation is in a somewhat unsettled and unsatisfactory condition in France. In this country we are seldom compelled to complain of insufficiency of laws, of the inadequacy of such as exist, of lack of the executive power to enforce them, or of a want of public sentiment to support all needed hygienic measures.

Of no part of this great country, unless it be some district beyond the pale of civilization, can it be said that there is no local authority to procure the immediate arrest and isolation of a person dangerous to the community in consequence of some infectious disease from which he is suffering. In the seventh lecture of this course Dr. Dujardin-Beaumetz makes this astonishing statement: "You should be cognizant of this strange and almost incredible fact that while we have the right on the public highway to arrest a man who has become a nuisance, or dangerous to his fellow-men by reason of arms which he carries, or the tumult which he occasions, or the outcries which he utters, we cannot prevent an individual affected with smallpox from perambulating the streets and spreading disease and death around him." Should such a phenomenon happen in any of the thickly-settled parts of the United States,—provided the disease were known to be *smallpox*,—it would take but a very few minutes to procure the arrest of such a person. He would be seized without the formality of a writ and removed to a place of safety. If the police were derelict in their duty, some private citizen, even at the risk of his own life, would arrest and sequestrate the offender; the sanction of the local board of health would be easily obtained, or the judge of the police court would declare the arrest justifiable and necessary.

So with regard to a case to which Mr. Martin has alluded, and in which is exemplified the pusillanimity of the authorities in France to whom is assigned the care of the public health. A house proprietor or tenant has in his family one or more cases of scarlet fever or diphtheria, and has thus established a centre of infection for his neighbors, who come and go unconcernedly. If this were yellow fever, cholera, or the plague, Mr. Martin virtually says, the authorities would know how to act, but, in view of its being a less deadly pestilence, they are practically powerless.

We will suppose such a family epidemic to happen in one of our cities or towns. A complaint is at once made to the board of health. Or, even before the complaint has been made, the attending physician of the family anticipates the complaint by reporting the outbreak to the agent of the board of health, as the law requires him to do. A card is immediately nailed over a conspicuous part of the infected house, stating the disease, and war

g people to keep away. Stringent measures isolation are now put in execution. Chil-en, especially, are not allowed to enter the use, nor is any member of the family al-wed to go to school or otherwise expose her persons to the contagion. Thorough infection from time to time, and especially the end of the sickness, is enforced.

So if a tenement is found to be offensively thy, if the proprietor keeps pigs which are nuisance, throws slops and garbage on his ighbor's premises, etc., a complaint is made the board of health, which has full power abate the nuisance, or, in the event of e board refusing to act, the complaint may carried before the State board of health, ich has power under such circumstances to , and all expenses of any investigation or secution may be assessed against the pro-etor who has kept his own premises, or made neighbor's, insalubrious.

his country has never been without sani-legislation adapted to the necessities of times, and long before the existence of te boards of health, or municipal boards health, there were provisions in the by-s and codes of all our cities for the sup-ssion of objects prejudicial to the public lth, such as garbage, carrion, stagnant ls, etc.; for the isolation of persons af-ed with contagious diseases, for the quar-ine of ships hailing from suspected ports, the prevention of the sale of diseased t or impure milk, for the preservation water-sources from pollution. Our fathers fectly well understood that the primary nt of all government is the protection of people, and that this protection means ell prophylaxis from the pestilence which ks in darkness as from the destruction ch wastes at noonday.

n New England the primitive system of tion of "select-men," "police-officers," nstables," etc., at the Town-Meeting still vails in rural districts; in the Western States town officers are elected everywhere by ot, as in all our cities. The select-men towns generally constitute the "board of lth." In cities the mayor and board of rmen, till a comparatively recent date, e invested with the functions of health cers.* The duties of these officers were rendered especially burdensome and disagreeable by the constant necessity imposed upon them of the supervision of sanitary matters; their salary was either nothing, or next to nothing, and complaints of nuisances requiring visits of inspection were frequent. These officials, moreover, not being medical men, were not always ready to appreciate the need of undertakings for the promotion of general sanitation, which might entail considerable expense on individual citizens or a large draught on the public treasury. Hence State laws were enacted which relieved all the elective departments of these onerous and responsible duties by the establishment of boards of health, these health officers to be appointed at specified times by the mayor and board of aldermen.

Boards of health derive their power partly from the mayor, council, and city ordinances, and partly from the State charter, which specifies their rights, duties, and prerogatives. These officials may be removed by the mayor for cause. Their by-laws and decrees must not conflict with previous ordinances of the city government, for they in no sense constitute a higher power than that to which they owe their appointment. Instances of contravention by acts of the board of health of statutes already in force are sufficiently numerous. The board of health of a city in the State of New York some years ago decided that a certain meat-market was, from its situation, a nuisance and prejudicial to the health of citizens, and they obtained an injunction against it as a first step to its suppression. The proprietors appealed to the city government, which had given them a charter or "permit," under which they were doing business. The board of health, finding that they would be baffled in their attempt to suppress what was in their judgment a first-class nuisance, took advantage of their temporary injunction, and had the obnoxious buildings removed. The butchers decided not to rebuild in that particular locality, and sued the city for damages, which they obtained; no prosecution against the board of health individually or corporately was deemed advisable or practicable. The board was, however, censured as exceeding their jurisdiction.

In another city there is an old ordinance prescribing the rights and immunities of a certain almshouse within the city limits. There is a clause in this ordinance permitting the keeping of pigs on the premises of the almshouse. There is another ordinance

* What I have said in this article is applicable principally to New England, with whose health organizations I am better acquainted than with those of the Southern, Middle, or Western States. The general constitution and functions of boards of health are, however, similar in all the States of the Union.

forbidding citizens to keep swine, but this law is a dead letter, except when adopted and enforced by the board of health. On one occasion the board attempted a regulation forbidding the keeping of pigs by all parties within the city limits, and ordered the pigs to be removed from the almshouse. An appeal was taken from their injunction, and the latter was declared to be illegal.

A frequent cause of complaint before boards of health is the filthiness of stables, and in more than one instance the board has been appealed to to abolish an obnoxious stable. Such an act would clearly be an invasion of the rights of property, and could only be justifiable under peculiar circumstances. It is necessary that horses shall be kept in cities, and that there shall be stables, and all city governments permit the establishment and maintenance of private stables and livery stables. All that boards of health can do when complaint is made of certain stables as obnoxious and filthy is to insist that the proprietors shall keep them in a tidy and clean condition. If a proprietor, after due notice, refuses to remove an offensive manure-heap and otherwise make his premises clean, he can be prosecuted for such disobedience and fined; it is also within the power of the board of health to cause the premises to be made clean at the expense of the proprietor.

It must, however, be added that the continued exercise of any employment or business whereby the health of communities is menaced can be prohibited, but if the person so offending bases his right to carry on his business in the particular place or building on a previous "assignment" or permit by the local government or board of health, it will be necessary to appeal to the superior court, which, on giving a hearing to both parties, may revoke the assignment, and forbid the further use of the premises for the exercise of the offensive trade or employment.

Such are some of the limitations of our boards of health. These officers are appointed by the mayor and his council, and are a subordinate branch of the municipal government. They can be removed for cause, —*i.e.*, if neglectful of their duties, or if they exceed their prerogatives. They can spend only a limited amount of money. If a small-pox pestilence were to break out, or any other sudden emergency should require a considerable outlay of money, the board of health could draw on the city treasury for a sum not exceeding two thousand dollars. If a greater expenditure were needed, they must call on the city council to grant it. They are, in fact, dependent on the city council for their appropriations, which they are expected not to exceed, unless there should be some unforeseen and urgent need. They can superintend sewerage (*i.e.*, insist on cleanliness, on the proper flushing of pipes, on traps, etc.) where a system of sewerage already exists, and oblige citizens, under certain circumstances, to connect pipes with sewers, but they cannot compel a city to undertake sewerage works, however pressing may be the necessity therefor. Operations of this kind can only be instituted by the city council. They can approve or condemn the drinking-water of a city, and on occasions can close up suspected wells when there is good reason for it, but this is the extent of their jurisdiction in this particular. They can require privies and cesspools to be cleaned as often as is deemed necessary, and they can insist that this shall be done in an odorless and inoffensive manner, but when they grant monopolies, which increase the cost to citizens and shut out competition, they exceed their powers and become oppressive.

From what has been said, it will be seen that in the possession of sanitary boards sufficient for the promotion of the prophylactic hygiene of communities,—*i.e.*, the suppression of the preventable causes of disease this country takes the precedence of France and probably of other Continental nations. The growing preponderance of physicians in the legislation of State and municipal governments has been remarked; this is especially seen in the constitution of our boards of health, which, as a rule, are presided over by a physician, and in the many really enlightened measures of sanitation which have emanated from medical men. Some writer has remarked that the world for many centuries witnessed the reign of the priest, that the nineteenth century has been the reign of the man of science, and the twentieth century will be the reign of the physician. Certain it is that the co-operation of physicians is becoming more and more necessary in all rational and efficient sanitary legislation.

I have thus far, it may be, emphasized too much the limitations of boards of health. these officials really possess all the power requisite for almost any conceivable occasion. They can enforce quarantine on all vessels coming from ports where a pestilential disease prevails, or they can prevent a

vessel from leaving the harbor of a town where a pestilential disease is raging. They can institute the most rigorous measures of prophylaxis and disinfection in a city or town where there has been an outbreak of a contagious disease. They can compel all physicians to report cases of contagious diseases occurring in their practice. They can shut up houses known to be foci of contagion, and establish pest-houses when required. They can close school-houses in infected districts, and, in the event of an epidemic of smallpox, they can compel all school children to be vaccinated under penalty of exclusion from school. They have a general supervision of cemeteries, and license undertakers. If any epidemic can be traced to a particular water-source, they can order the purification or suppression of the latter. They can prosecute, fine, or imprison a man known to have sold tainted or diseased meat. They have almost unlimited power in abating nuisances,—*i.e.*, objects prejudicial to the public health by offensive odors or the propagation of disease-germs. They may not be able to drain or otherwise purify a malarious marsh, from want of funds, but they can take the initiative in this direction by calling the attention of the municipal councils, and, it may be, the State board of health and the State Legislature to the evil, and insisting on its removal. So with regard to sewerage. Though boards of health may not of themselves institute a system of sewerage, they may, by appeals to the city government and by the dissemination of suitable documents, call public attention to the necessity of sewerage, and they may have a general superintendence of works designed for this end. Complaints of ill-ventilated or imperfectly-constructed sewers properly come before them. In short, there is nothing which directly or indirectly affects the health of the people, that does not come within their province. They may make by-laws which, as far as they do not conflict with the general statutes, are of equal authority with the ordinances enacted by the city council.

Such, in the essential features, is the constitution of our local boards of health. This system, with its checks and limitations, is, perhaps, the best that can be devised for the purpose. The presence of one or more medical men on the board is, without doubt, an element of strength, albeit the "chairman," appointed often by favoritism, is not always the best man for the place. The system has given good results, and it is hard to conceive how it could be much improved.

The functions of the State boards of health are of a more general character. They are not so limited in the expenditure of moneys, as they may draw on the State treasury to any reasonable extent. They constitute an advisory board to the municipal boards. To them belong elaborate and expensive investigations into the causes of disease in particular localities. This may be a large district, comprehending the territory of many local boards of health, infested, it may be, by malaria, and needing a costly system of drainage. Here the State board of health has the power and can command the funds to deal with the problem. They have a general superintendence of the sewerage of the cities of the State; may at any time make investigations when complaints are made; their approval of sewerage systems before their final adoption is generally required; where serious defects in any existing system of sewerage are shown, they can indicate the remedy. If any epidemic—of cholera infantum, diphtheria, typhoid fever, smallpox—is especially prevalent in a certain locality, they can co-operate with the local boards in endeavors towards the suppression of these diseases. The general supervision of the water-supply of cities comes within their jurisdiction. If any corporation, for instance, proposes to take water from a certain stream or lake, for the use of a particular town or city, the approval and permission of the State board of health must first be obtained. They can make investigations into the adulteration of food and drugs. They can insist that school-houses and other educational institutions shall be well ventilated, that the desks shall be after a certain pattern, that the surroundings of these schools shall be in a good sanitary condition; in this particular they have a joint responsibility with the local boards of health. They can shut all the ports of the State against the introduction, by vessels coming from foreign ports, of cholera, yellow fever, or any other grave pestilential disease; epidemics (like the epizootic) among cattle, horses, or swine equally come within their cognizance and jurisdiction. They can make it impossible for certain occupations attended with offensive emanations (like tanneries, gas-works, etc.) to be carried on within the precincts of a city. They may condemn a certain manufactory (as of wall-papers tinted with an arsenical pigment, clothing containing poisonous dyes) as prejudicial to the health of citizens, and doom it to

radical modification or extinction. In short, there is nothing pertaining to the air, water, food, drugs, beverages, or occupations of citizens which may not come under the supervision and jurisdiction of State boards of health, as well as of the local boards.

I may remark, finally, that in the late unparalleled disaster at Johnstown, Pa., the efficiency of the State Board of Health, acting in conjunction with delegates from many local boards and physicians from all parts of the State, under circumstances the most trying that can be imagined, in superintending and directing the removal of *débris*, the disposal of putrefying corpses, the thorough disinfection and purification of the locality, is creditable to our civilization.

The functions of the National Board of Health are still more general than those of the State, though similar in kind. If a pestilence should menace the whole country, or considerable portions of it, the national board would be a centre of organized effort for its suppression. Local boards of health, and even State boards, can only quarantine certain harbors; the national board can control the whole frontier of a nation, and the whole sea-coast, and establish a quarantine system on a large scale; if need be, shutting off for a time all foreign commerce. It might be deemed needful, in the event of an invasion of yellow fever, to close the Mississippi to all steamboat transit. It might be necessary, at great expense, to establish quarantine stations in the Gulf of Mexico, at the mouth of Chesapeake Bay, at the mouth of the Mississippi River. Sanitary measures of such magnitude could not be undertaken by State boards of health, but properly come under the province of the national board, with the almost unlimited funds at its disposal. A glance at the expenditures of this board for one year—from July 1, 1880, to June 30, 1881—shows that the considerable sum of two hundred and two thousand and sixty dollars was expended in the maintenance of quarantine and inspecting stations, in aid to State and local quarantines, for special investigations and sanitary surveys, for salaries and travelling expenses of members of the board, of inspectors, etc. The expenditures of another half year were more than a quarter of a million,—*i.e.*, two hundred and eighty-four thousand three hundred and thirty dollars.

The national board undoubtedly is doing a great deal to encourage special investigations upon the subjects of cholera, malaria, typhoid and typho-malarial fevers, diphtheria, and cerebro-spinal meningitis. It has done good work in the way of sanitary surveys of unhealthy localities, in the establishment of more effectual methods of collecting and reporting vital statistics, and in the collecting of information with regard to the sanitary condition of some of the principal cities and towns of the United States. The appointment of commissions to investigate yellow fever has not as yet been fruitful in any very positive results, yet it cannot be denied that in this direction is knowledge and progress.

Many of the investigations made under the auspices of the National Board of Health have been of exceeding value. I might specify the investigation of the flow of sewers in relation to their sizes and gradients, carried on under the direction of Colonel Waring, with a view to determining the most efficient and least expensive form of sewers. The board claims that the results of this investigation have already been of practical importance, since it was a presentation of the report to the committee charged with the sanitary survey of Memphis which led that committee to recommend a scheme for the sewerage of that city which has made Memphis one of the cleanest and healthiest cities in the southwestern States.

Other subjects which come within the jurisdiction of this board are: the hygiene of the mercantile marine, and the legislation needed to improve its sanitary condition; investigations to ascertain the influence of various soils upon sanitation; investigations as to the influence of certain climates on certain diseases; investigations as to the prevalence of adulterations in food and drugs in the United States; and inquiries into the diseases of food-producing animals of the United States.

The National Board of Health consists of eleven members, appointed by the President. They meet semi-annually, and in the interval of the meetings, the executive committee (consisting of five members) have power to act for the board.

N.B.—In a foot-note I have stated that my account of the organization, mode of appointment, and prerogatives of local boards of health is in accordance with existing arrangements in Massachusetts. This I believe to be the ideal system, and I believe that, despite some trifling variations from this plan in many other States, all similar organizations will eventually "come into line." In the essential principles all boards of health are alike.

I am well aware that in multitudes of small

towns there is as yet no properly-constituted health board. Yet, on the whole, the country is well provided with sanitary organizations; the members are wide-awake, earnest men, and there is hearty sympathy and co-operation between the local boards, the State boards, and the national board, which, when acting singly, are capable of producing results of far-reaching beneficence, and, when acting in concert, must command the wonder and admiration of the world.

A CASE OF PETROLEUM-ETHER POISONING.

By Joseph Leidy, Jr., M.D.* (Univ. of Penna.)

THE following interesting case of petroleum-ether poisoning was admitted to the University Hospital during the month of May, 1888:

M. P., æt. 19, strong, plethoric man, weight one hundred and eighty pounds, a worker at Point Breeze Oil-Works, had been ordered to cleanse a large oil-tank, the substance used being petroleum-ether, or benzine. He was found soon after lying upon the ground in an unconscious condition, in which state he was admitted to the University Hospital. From a fellow-workman I glean the following history: A new hand at the work, he had evidently used the substance in too large a quantity, for he was found soon after in the condition described, but, as his fellow-workmen thought, dead. Active means for resuscitation were resorted to, but with no avail. While a conveyance was being sought to remove him to his home, he was seen to move. In doubt as to his condition, they hurried him to the hospital, where I found him in the following condition: A man with a remarkable fine physique; unconscious; pulse strong and full, 60; respiration 14, very feeble, almost imperceptible; slight cyanosis; temperature 96.2° in the axilla; the body was cold; apparently but slight peripheral circulation in the extremities, arms, and legs, notably the nose and ears, which felt like ice; pupils widely dilated, and did not react to light; nystagmus, conjunctivæ barely sensitive to touch; paralysis of lower extremities, with incontinence of urine and fæces. The upper extremities resisted movements. Urine was tested and found normal, but with an ethereal odor. The driver of the patrol-wagon states he had a general convulsion (?) on his way to the hospital. Artificial respiration and friction, with mustard, of the body and extremities was immediately resorted to, and kept up for half an hour, when we were rewarded by the patient taking several deep inspirations voluntarily. We persisted in this course until we had further evidence of return of consciousness. In an hour and a half from the time of his admission he opened his eyes and spoke, complaining of severe frontal headache. This gradually disappeared towards morning, when he was feeling so much better that he insisted upon leaving the hospital, which he did that day, feeling, as he stated, "as well as ever."

Lewin (*Virchow's Arch.*, vol. cxii., April, 1888) has written an extremely interesting article upon the poisonous action of petroleum upon the animal organism, from its internal administration, and with especial reference to its local action upon the skin ("Ueber Allgemeine und Hautvergiftung durch Petroleum").

He succeeded in inducing a number of students to take the substance in a liquid form, and studied its action in varying quantities up to 300 c.c. He describes several varieties of its poisonous action, the principal of which are,—

1. The *gastro-intestinal* variety, including its action upon the kidneys.

2. Cerebral variety, with unpleasant after-effects.

During his stay in America, several years ago, he visited the principal oil-works, and studied its action upon the skin. Its action upon the stomach and intestines is that of a *gastro-intestinal* irritant. Upon the cerebrum its action is somewhat similar to that observed in the case just recorded, with the absence of after-effects. The intense *acne* which is produced upon the body exposed to the substance, both in a liquid form and as a vapor, is familiar to those having charge of dispensaries in the vicinity of large oil-works.

The above case is interesting, as showing the effect of the absorption through the lungs. It is a rare occurrence at the oil-works, and the writer is unable to find any reference to a similar case. The profound unconsciousness, paralysis, partial anæsthesia, and convulsions (?), with incontinence of fæces and urine, lead us to infer that it must have a direct action upon the cerebro-spinal axis. It is possible that the anæsthesia was complete

* Resident Physician Hospital University of Pennsylvania.

when the patient was first discovered, as the distance from the works was fully two and a half miles.

The indications for treatment were simple,—to sustain the heart and respiration, which we did by artificial respiration and frictions, with the internal administration of coffee. Lewin suggests the use of apomorphine in those who have swallowed the drug in liquid form.

The symptoms in the above case compare favorably with those recorded by Lewin, with the following exceptions: In Lewin's cases no reference is made to its action upon the centres dominating urination and defecation. This may be explained from the fact that no case was so profoundly affected as this. The pulse was variable, irregular, slow, feeble, and small. In the above case, however, the pulse, though slow, was strong, full, and with high tension. The pupils did not react to light, which is in accord with the observations of Lewin, though Meyer (*Journal de la Société Méd. d'Anvers*, February, 1865) has noted, with the dilatation, normal reaction to light.

Petroleum-ether, or benzine, is a mixture of several organic compounds, which belong to the marsh-gas CH_4 series. It is rendered volatile at a temperature slightly above the bodily range. As petroleum-ether is a mixture and not a definite organic compound, the active factor in the mixture which gives rise to the above symptoms is not known. It is highly probable that each compound in itself plays a definite part in their production. Its great solvent property for fats and oils, in connection with its cheapness, make it particularly desirable for the purpose for which it is used.

ON DIETETIC CURES.

By Joseph Schmidt, M.D., Berlin, Germany.

As the gratifying result of gradual but palpable changes, the modern healing art no longer centres in the existence of an extensive chemico-pharmacal armamentarium, but in the light and the exhibition of simple hygienic principles. The old adage of the ounce of prevention has acquired the dignity of scientific doctrine. The modern therapeutist, besides, no longer treats the diseased organ but the diseased man, and he searches for remedial methods and not for remedial substances.

To induce a salutary modification in an affected organism, no more favorable point of aggression can be chosen than the digestive tract, and no more effective method can be exhibited than an appropriate and scientifically constructed diet. Frerichs, the celebrated German clinician, justly designated the dietetic treatment "one of the most important levers of the physician's technique." The tendency of the modern therapeutical school is to ever widen the sphere of applicability of the dietetic treatment of diseases, which includes, besides the diet as such, also certain other measures.

Of all morbid processes none is more suitable for a dietetic treatment than fever. The assumption that antipyretics, such as quinine, antipyrin, antifebrin, thallin, kairin, and others, can cure or, at least, favorably influence the febrile process, is to-day held by but few practitioners. Fever may by antipyresis be suppressed for a certain length of time, but it cannot be eliminated as long as its causes continue. Indeed, some clinicians, like Nothnagel and Naunyn, claim that the microbic causes of fever perish in the high temperature of the fever, and that it would, consequently, be imprudent to attempt the destruction of the bridge nature has built for its return to health. If the cause of the fever is unknown, or cannot, if known, be removed, fever can rationally be treated only by dietetic measures. The advocates of this treatment, however, are divided in two groups holding opposing views in this connection. The representatives of one group put the fever patient on a hunger diet, believing that any supply of victuals causes an increase of the fever, in the same manner as, for instance, a fire would be nurtured by the addition of oil. The view of the other group is that the supply of victuals is to be permitted within certain limits in order to make up for the increased tissue changes produced by the fever. Professor Jürgensen, the chief advocate of this view, justly asks the following question: "If we are compelled to keep up a fire in our room, would it be better to buy wood or to throw the chairs of the room into the fire?" This clinician regards it as an economical mistake to sacrifice to the avidity of the fever the tissues of the body, instead of protecting the organism by substitution of foreign materials. The latter view is becoming daily more popular. The best results have in many instances been obtained by giving the fever patients a good supply of strengthening food. The most important food for a fever patient

water, which, pure, or with addition of acids or milk, or in the form of rice-water or gruel, ought to be given every half-hour. In greater intervals, to represent, as it were, the principal meals, a mixed diet is to be exhibited. Bouillon with egg, milk, stewed fruit, a little broiled steak, and the broth prepared from calves' feet (rich in glue-like substances) are recommendable. The important *rôle* of alcohol in the treatment of fever has long been known. This agent is of undoubted value in fever by its capacity to lower the temperature and to protect the tissues. Still, alcohol is to be used with caution, for, as Professor Stillé said, it did harm if it did not do good. Strict individualization regarding its use, therefore, is indicated.

The great therapeutic value of a dietetic treatment is well illustrated by the success of the Weir Mitchell treatment in certain forms of nervous affections, particularly in hysteria and in advanced nervousness. It must be gratifying for the American profession to learn that the Weir Mitchell treatment is as familiar to the physicians of Europe as to the American practitioners. The theory of Mitchell, that the cause of the nervous affections mentioned is chiefly a deterioration of the blood produced by its deficiency in fatty matters, indicates sufficiently the dietetic measures needed. If the disordered organism could be made to take up greater quantities of fat, and the quality of the blood be thus improved, the condition of the patient could, according to the Mitchell theory, be materially changed for the better. This desideratum, however, could not be obtained merely by an abundant supply of victuals, as the weakened organism would be unable to digest such a supply. But, in combination with absolute rest, massage, and electricity, the object aimed at is often readily attained. Other important factors in the Mitchell treatment are, as every physician knows, removal from the habitual surroundings, permanent rest in bed, and a systematic supply of nutritious victuals, chiefly of milk. Half a pint of milk is taken *pro die* in the beginning, and within a few days this quantity is increased until two to three pints are given as the daily ration. As additional victuals, the patient receives soft-boiled eggs, rolls with butter, broiled steak, a few vegetables, farinaceous dishes, and roasted potatoes in fixed quantities and definite intervals. In order to facilitate the digestion of the exhibited food, the muscles of the body are treated twice a day by electricity and massage. An increase of the bodily weight and general improvement of the patient's condition is soon noted, provided the cases have been carefully selected for this treatment.

An almost diametrically opposite dietetic treatment is employed in cases of lipomatosus and plethora. Among the best-known forms of what might be termed the deprivation cures is the so-called Schroth's "trockenkur" (dry cure). The principle of Schroth's cure is to deprive the system of water (and partly also of solid constituents) by getting the patient to abstain from water as much as possible. The diet allowed by Schroth consists chiefly of dry rolls (two to three days old), gruel, and a little wine. This method, however, has been found to be not altogether free from injurious after-effects, and is to-day but little used in its unmodified form.

Similar has been the fate of the once celebrated Banting cure, which the English physician Harvey once ordered for Banting, who turned the scales at two hundred and two pounds. The Banting cure proscribes all fatty and solid foods in general, besides chocolate, cacao, and stronger alcoholic beverages. The bill of fare, particularly as modified by Vogel, is very simple, and contains coffee, tea without milk or sugar, toast, soft-boiled eggs, lean raw ham, thin bouillon, lean meat, some few green vegetables, potatoes, and a little light wine. This treatment has in many cases been successful, though it is based on false physiological principles,—viz., that fat, as was taught by Liebig, was formed from fats and carbohydrates. In numerous instances, however, the patient became so emaciated that the cure had to be interrupted. As, besides, psychical disturbances and even consumption have occasionally followed this treatment, it is to-day but rarely resorted to.

The failures of both the Schroth and the Banting cures led Professor Ebstein, of Göttingen, to propose a new dietetic cure on a wholly different basis. The Ebstein cure was based on the doctrine of Professor von Voit, that fat was formed chiefly by albuminous food-stuffs, particularly if supplied in conjunction with carbohydrates. Voit taught, besides, that fatty substances had not only no influence whatever on the formation of fat, but, on the contrary, prevented lipomatosus and plethora by producing the sensation of satiation and lowering, consequently, the want of food. Ebstein ordered carbohydrates, such as bread and vegetables to

a limited extent, and allowed all kinds of meats, even fatty ones, butter, and fatty gravies. He interdicted potatoes and sweet substances. But it did not last long before the physiological views, which formed the basis of the Ebstein cure, were attacked and discarded, and the Ebstein cure suffered the fate of its predecessors, the Schroth and Banting cures.

Another new method soon made its appearance, which, by its thoroughly scientific basis and practical general nature, at once eclipsed all previous dietetic cures. The merit of having worked out by laborious scientific researches and numerous practical trials the new dietetic cure belongs to Professor Oertel, of Munich, though it is popularly known as the Schweninger cure. This misnomer arose from the fact that Dr. Schweninger, at that time a practitioner in Southern Germany, cured Prince Bismarck from his obesity by this method, in acknowledgment of which he was appointed a professor in the University of Berlin, against the unanimous vote of the faculty. The Oertel method is suitable for cases of lipomatosus, particularly if combined with a depressed cardiac power, resulting from fatty infiltration of the heart; besides, in such cases as result from high living. The main principle of the Oertel treatment is to deprive the body of as much water as possible, and to attain at the same time a strengthening of the heart-muscle. The regulation of the fluid constituents of the body Oertel secures both by reduction of the supply of liquids and by the increase of the secretion of liquids. The ingestion of liquids is reduced in this treatment to a minimum. Oertel says the sensation of thirst is but the result of the former habit of drinking, and can be suppressed by mere gargling. The increase of secretion of liquids Oertel induces by the perspiration subsequent to physical exercises and to the application of dry heat (steam-baths). The food allowed by Oertel consists chiefly of albuminates (eggs and lean meats), which cause a diminution of the stored-up fatty deposits of the system. The principal factor, however, to attain the last-named object are such physical exercises as tend at the same time to strengthen the heart-muscle. These exercises consist in daily and continued mounting of elevations, persisted in until palpitation of the heart sets in, and resumed again when the palpitation has disappeared. Exhaustion, to be sure, is to be carefully avoided. Oertel has worked out his method into the minutest details, and exacts a strict observation of them. His success has in the majority of cases been extraordinary.

It will, in conclusion, not be amiss to briefly mention some other dietetic cures which formerly enjoyed, particularly in Germany, great popularity, but have of late, perhaps without justification, been neglected. Particular mention deserves first the old-fashioned milk-cure which was in the past held in high repute in pulmonary, renal, and principally in cardiac affections. Almost equal popularity in the stated affections was enjoyed by the whey cure, though many physicians have denied the therapeutic worth of this cure altogether. Grape-cures are still popular in Germany in conditions of general plethora, hemorrhoids and similar disorders. The koumiss-cure, which is of a rather recent date, has given excellent results in cases of consumption, chronic intestinal catarrhs, scrofulosis, and anæmia, Koumiss, or wine-milk, is the milk of the Russian mare of the steppe, in a state of alcoholic fermentation. It is prepared by mixing a bottle of koumiss with ten bottles of fresh mare's milk, beating the mixture with a rod, and putting the liquid into well-corked bottles, which are to be stored away in an ice-cellar or ice-box. A prolonged use of koumiss favors the deposit of fat in the body.

The latest acquisition in the line of dietetic cures is the kefir-cure. Kefir, like koumiss, is a product of fermentation of milk, and is prepared from cow's milk by addition of a special ferment,—the kefir-corn. This ferment, a mixture of alcoholic yeast and bacilli, is placed into ordinary milk, which causes their swelling up. The mixture is then put into well-corked bottles and stored away. It is, however, necessary to shake the bottles well up at certain intervals. After a few days the kefir is ready for use. It is a strongly effervescent, cream-like drink, of a sour taste. It is as yet impossible to say whether kefir in reality possesses the high therapeutic value which is claimed for it. Kefir is, in Germany at least, becoming a very popular remedy, and is for sale not only in all drug stores, but also in very many grocery stores. Its cheapness,—about five cents for a large bottle,—of course, is a recommendation of the remedy to the poorer classes of the people.

It is an undeniable fact that the dietetic method of treating diseases is gradually getting a firm hold on both the profession and the great public.

CASE OF POISONING BY JAPANESE LACQUER.

CASE OF POISONING BY ADMINISTRATION OF HOMŒOPATHIC PELLETS LABELLED "RHUS."

CASE OF POISONING BY THE CASHEW-NUT,—ANACARDIUM OCCIDENTALE.

By D. W. Prentiss, M.D., Washington, D.C.*

Case of Poisoning by Japanese Lacquer—the Sap of the Rhus Vernicifera.—March 20, 1889, I was called to see Mr. H., who sent word he was poisoned by Japanese lacquer. Not knowing what Japanese lacquer was, I responded promptly, and found Mr. H. suffering greatly from a vesicular inflammation of the face, ears, neck, hands, and scrotum, having exactly the appearance of poisoning by *Rhus toxicodendron*. The eyes were nearly closed and the itching intense. He informed me of the nature of the poison and how he came by it, remarking that he did not suppose anything could be done for it, but that I would probably be interested to see the case, that it was of very frequent occurrence in Japan, and that the natives allowed it to run its course. Mr. H. spent several years in Japan as instructor in natural history, in this way becoming perfectly familiar with lacquer, its uses and its accidents. It is to be remarked that he considered himself entirely insusceptible to the poison of the rhus, never having been affected in this country, though repeatedly exposed, had often handled the vine, and supposed he could not be influenced by it. He visited the lacquer-factories in Japan, and studied their methods of work with impunity.

The Japanese themselves very much dread the poison, and Mr. H. says he had trouble to get any of his students to accompany him as "interpreters" to the places of manufacture. Those who are subject to the poison suffer precisely as patients afflicted by the rhus or poison ivy. Of course, those engaged in the lacquer work are not affected by it, but whether one acquires immunity after a time I am unable to tell. However, if the poison is a volatile acid, as Rein supposes, it would seem possible to remove it by a heat that would leave the lacquer uninjured, and thus make it available for use in this country.†

The manner in which the poisoning occurred in this case was as follows: Mr. H., in pursuance of his studies at the National Museum, in Washington, D.C., opened a bottle of lacquer which had been in the museum for years. There was a feeling as of a warm breath over the face, and a suffocating, disagreeable odor, which he could not liken to any known odor. It was neither musty nor pungent, but very unpleasant.

The irritation of the hands and face came on gradually for three days, when it was as described above, and confined him to the house. He was ordered a liniment of

℞ Acidi carbolici, 1;
Ol. lini,
Aq. calcis, aa 50.

To apply constantly over the inflamed surfaces, and in addition a ten per cent. solution of carbolic acid to be applied over any intensely itching part.

He was sceptical of getting any relief, and had made up his mind to stand it until it ran its course.

When I called the next day he expressed himself as much delighted at the effect of the application, as it had almost entirely relieved the distress.

Subsequently the case ran the usual course of rhus-poisoning to recovery in ten days.

There was no irritation of the mucous membranes of the nose, mouth, or air-passages, as might have been expected from the inhalation of the poison.

The treatment here prescribed I have used in a number of cases of rhus-poisoning with the best results, more than once in my own person.

I always provide my family with a supply when they go to the country for the summer. It is useful not only for the purpose mentioned but is also an excellent liniment for burns, erysipelas, bee-stings, and bites of insects.

In the article on Japanese lacquer by Mr. Romyn Hitchcock—which I have just quoted—is an interesting account of the whole process by which the lacquer-ware is made, and also a chemical analysis of the juice.

"The tree—*Rhus vernicifera*—grows throughout the main island of Japan, and attains a large size, the trunks sometimes measuring a metre in diameter. It is said the tree will live for forty years, but only comparatively young trees are valued for the production of lacquer. The lacquer exudes from horizontal cuts in the bark in the form of a rather viscid emulsion, and may be col-

* Professor of Materia Medica and Therapeutics, Medical Department, Columbian University, District of Columbia.

† "Preparation of Japanese Lacquer and the Manufacture of Wakasa Lacquer-Ware." By Romyn Hitchcock.—*Proceedings U. S. Nat. Mus.*, vol. xi.

sions, erection of this tissue takes place, the dilatation of its cells being in all probability under the direct dominion of the vaso-motor nerves derived from the spheno-palatine ganglion. It is the temporary orgasm of these bodies that constitutes the anatomical explanation of the stoppage of the nostrils in acute coryza (or rhinitis), and their permanent enlargement is the distinctive feature of hypertrophic nasal catarrh (or hypertrophic rhinitis). This erectile area is, moreover, as has been elsewhere shown,* especially concerned in the evolution of the many curious reflex phenomena which are observed in connection with nasal and aural affections. Indeed, the changes which it undergoes seem to lie at the foundation of nasal and aural pathology, and furnish the key-note to the correct interpretation of their disease, and also to many obscure affections in the remote organs of the body."

The second variety is termed hypertrophic rhinitis (or, improperly, hypertrophic nasal catarrh) : this, from its long continuance and true chronic character, produces a true hypertrophy. The larger portion of the mucous membrane of the posterior portion of the nasal passages and lower turbinated bones are thickened, the glands of the vault of the pharynx become swollen, enlarged, and relaxed, and the secretions from them and those of the mucous membrane are excessively thick and tenacious. The patient is oppressed and breathes with difficulty, the voice being nasal, with deafness.

The third variety is termed atrophic rhinitis (atrophic catarrh, or ozæna). This third variety is almost always accompanied by a disagreeable odor, and a diminution, more or less, of the sense of smell and taste on the part of the patient. The rhinoscopic examination of the nasal fossæ will show an extreme thinning of the pituitary membrane, with atrophy of the turbinated bones. In consequence of the diminution of the inferior turbinated bone at times, the opening of the Eustachian tube filled with a discharge can be seen through the nostrils, causing at times deafness. The atrophied mucous membrane takes on coat after coat of solid and obstinately adhering crusts, which give off the characteristic fetor.

Prophylaxis.—The general health of persons affected by these three varieties of disease of the nose, throat, ears, and adjoining cavities, is more or less affected, depending on the degree of the affection, or whether it be associated or complicated by various constitutional diseases, as scrofula, syphilis, tuberculosis, or other hereditary vices, with the "neurotic factors."

Prophylactic Treatment.—Placing the patient in a good healthy climate,† well fed, frequent bathing, frictions, massage, etc., attention to clothing, and by treating the various affections with mercury, the iodides, and the active principle of cod-liver oil, with counter-irritants to the spine, if tender and sensitive.

Treatment of Simple Chronic Rhinitis.—First, cleanliness; washing out the nose with hot water containing a few grains of biborate of sodium, and then carefully blowing into a handkerchief; no hawking or the use of strong saline solutions under high pressure, nor irritating powders, which in themselves cause the disease to become permanent. Milk-warm fluids should be applied in the form of coarse or fine spray, and should be kept warm. This treatment, with a few doses of Dover's powder at bedtime, and from 2 to 3 grains of quinine every hour, in the form of a compressed pill, until eight to ten grains have been taken, will usually cure the case. Should the case become more obstinate, and these measures fail, various cleansing and disinfecting solutions are employed with the nasal-spray apparatus or the posterior nasal syringe, but the basis of all washes is a mild alkali and carbolic acid. The following is one of those solutions recommended by Lefferts, of New York :

℞ Acidi carbolici, ℈i;
Sodii boratis, ʒi;
Sodii bicarbonatis, ʒi;
F. glycerin, ℥i;
Aquæ rosæ, ℥i;
Aquæ, ad Oi. M.

This second is Dr. Seiler's, of Philadelphia, a more elaborate prescription, containing the following ingredients :

* *Am Jour. Med. Sci.*, July, 1883, p. 106.

† 1. The climate must be such as to insure *pure air free from dust and other poisonous germs.*

2. Such air is more apt to be found at an elevation of one thousand feet or more above the sea-level.

3. There should be an equable temperature, neither too warm nor too cold; the air should be in continuous motion, and yet there should be no wind-storms.

4. There should be plenty of sunshine.

5. The landscape should be pleasing.

6. The health resort should be easily accessible, and home comforts with congenial society easily obtained.

7. The patient should be able to take almost daily outdoor exercise without fatigue.

℞ Sodii bicarb.,
Sodii bibor., āā ʒviii;
Sodii benzoat.,
Sodii salicylat., āā gr. xx;
Eucalyptol,
Thymol, āā gr. x;
Menthol, gr. v;
Ol. gaultheriæ, gtt. vi;
Glycerin., ℥viiiss;
Alcoholis, ℥ii;
Aquæ, q. s. Oxvi.

This formula gives a solution which is sufficiently alkaline to dissolve the thickened secretion adhering to the nasal mucous membrane, and, as it is of proper density, it is bland and unirritating, leaving a pleasant feeling in the nose. At the same time, it is antiseptic and acts as a deodorizer, being considered in this respect far superior to Dobell's solution.

The following modified form of Dobell's has been used with great satisfaction:

℞ Acidi carbolici, gr. iv;
Sodii borat.,
Sodii carbonat., āā gr. xx;
Liquor. opii sedativæ, ʒss;
Glycerin., f℥i;
Aquæ destillat., ad f℥iv. M.
Filter, and use in atomizer morning and night.

In addition to the above, we use the following: f℥i vini picis, as employed at Jefferson College Aural Clinic. After the cleansing mixture use a two-per-cent. solution of antipyrin, and apply hot to the parts. This solution possesses hæmostatic properties, and gives relief to occlusion from the irritable condition of the turbinated bones. It has the advantage over cocaine, in not producing complete local anæsthesia, nor any tendency towards a habit. It has one objection,—it produces a smarting sensation. Combined with cocaine, it increases the local action of the latter, enabling it to be used in a weaker solution. In the more aggravated form of hypertrophic rhinitis, after the treatment by means of the post-nasal syringe or by mopping with various disinfecting solutions, applied warm, and when these foreign materials have been removed, applications of astringents are then employed to give tone to the parts, such as tannin and camphor, boro-glyceride, iodine, and glycerin, solutions of sulphate of zinc, nitrate of silver, powders of iodol, and iodoform with boracic acid. Again, by means of the ring-knife, covered knife of Daily, or the forceps of Menière and others, permanent hypertrophic enlargements, adenoid growths, and faucial tonsils, with enlarged foreign growths, can be punctured or incised or removed. To determine between positive or permanent growths, spasmodic or temporary ones, arising from actual deposits of foreign material, the parts should be painted with a two- to four-per-cent. solution of cocaine, which will cause the spasmodic enlargement to disappear, but will not affect the permanent. These operations are to be accomplished with great care, especially if the patient is suffering from an affection of the ear, as we have found the actual or galvanic cautery applied in the vicinity of the ear to cause inflammation of the Eustachian tube with acute otitis media followed by perforation of the drum membrane. Even when blood accidentally passes into the Eustachian tube from an operation, and impinges on the membrana tympani, it will sometimes act as a foreign body and produce perforation. In the use of an anæsthetic, it is never safe to employ a systemic one, such as ether or chloroform. It is best to use a local one, like cocaine or antipyrin, or a combination of the two; but it is not safe to employ a solution in spray stronger than from two to four per cent., and now and then to localize the point to be operated upon, and use vaseline, or a powder of starch and cocaine, applied right to the spot.

Atrophic Rhinitis or Ozæna.—Treatment.—Cleansing the parts, and the use of the spray, both coarse and fine, with a solution of bichloride of mercury, 1 part to 9000 or 10,000, in hot water, with a small portion of cocaine and morphine in solution to relieve pain. After the spray employ absorbent cotton daily, cleansing the parts, using insufflations of impalpable boric-acid powder, with a minute portion of iodol, subiodide of bismuth (in syphilitic cases); iodoform, with antipyrin, should there be ulceration. In some instances Politzer's plan* should be followed. My treatment, in non-syphilitic cases, is nitrate of silver, 1 part to 10 of water, applied on cotton by forceps well into the back part of the nostril and pharynx, wiping around the outside of the nostril, to prevent discoloration, with a solution of caustic potash. I cleanse the parts with a solution of boracic acid before the application of the silver, which I apply once a day, while with the spray the patient cleanses the nostrils twice a day, using the spray warm, for three weeks, with the following powder dissolved in water:

* See Turnbull's "Defective Hearing." J. B. Lippincott Company, Philadelphia.

℞ Potassii bicarb., chlorate, and salicylate, of each four parts, to one pint of hot water.

The following three cases from my note-book will serve as illustrations:

CASE I.—*Obstruction of the Eustachian Canal.*—This occurs in rhinitis or subacute catarrh of the middle ear from thickening of the mucous membrane, also from spasmodic swelling of the parts, or a combination of both conditions. The following case will illustrate the above: M. H. D., aged 35, a school-teacher, a spare, delicate, bilious man,—such, by the way, being the most difficult cases of deafness to treat successfully, from the noises peculiar to a school, or the constant disturbance of temper, or the impure sanitary condition of the atmosphere,—such, as a rule, are almost always much depressed in regard to their condition. The case referred to, being similarly affected, having but one moderately good ear on which he depended, finally lost the hearing of this ear by chronic inflammation of the mucous membrane with thickening, but just at the time he appeared at the clinic at Jefferson College there had been an entire closure from spasm. My assistant had endeavored to open the pharyngeal orifice by means of Politzer's air douche, but had failed. I attempted to introduce the Eustachian catheter, but was met by a distinct wall of elevated tissue, and was unable to pass the obstruction. I applied a four-per-cent. solution of hydrochlorate of cocaine, warm, through the nose to the naso-pharyngeal cavity, also introducing a few drops into the catheter, charging my Politzer bag with from ten to fifteen drops of ether, which is an antidote to the injurious effects of cocaine. I also charged the catheter by dipping it into the solution, which allowed the vapor to enter into the middle ear with ease, and relieved the patient without giving him pain, much to his delight.

Now, in chronic thickening of the middle ear I use ether, with or without iodine, or, as a sedative, bromide of ethyl. My method of applying it is by means of Politzer's bag. I drop 8 to 10 drops of the ether alone or combined into the bag. The patient takes some water in his mouth and holds it there. A nose-piece is put in his nose, and, just as he is swallowing the water, I squeeze the ether-vapor through the nose-piece into the passages. I have had a very large experience in the use of this combination in these cases. I find that ether, alone or combined, is the very best application, for the following reasons: 1. Ether is very highly stimulating. 2. It is a powerful anodyne, when combined with bromide of ethyl, particularly in cases where tinnitus aurium is a symptom.

CASE II.—*Ear-Disease complicated with Swollen Erectile Tissue in the Nose, depending in Part on Uterine Irritation.*—Miss M. H. suffers from middle-ear deafness, and also from disease of the nervous and uterine apparatus, employing most of the time Seiler's tablets with the spray, also iodine and glycerin into the nostrils. While watching a fire in her neighborhood, under great mental excitement, with her head out of the window during the night, and very cold, she contracted a severe rhinitis, followed by a profuse watery discharge. She was relieved of acute symptoms by the use of pulv. Doverii at bed-time, and through the day aconite and belladonna, and pills of bromide of quinine. Then followed cough and copious expectorations of yellow pus, the nostrils being completely filled up. The condition was relieved by a spray of antipyrin (a two- to four-per-cent. solution), and the deafness by opening the Eustachian tube. The following prescription was then given:

℞ Morphinæ acetat., gr. i;
Spts. vin. rect., ʒi;
Syr. aurantii rub., ʒi;
Aquæ, ʒi. M.
Sig.—A teaspoonful at 7 and 10 P.M.

This afforded entire relief.

CASE III.—*Throat and Ear Case. Great Improvement by combining the Treatment.*—There are numerous cases of throat affections, enlarged tonsils, and naso-pharyngeal disease which have no apparent influence upon the hearing; yet, on the other hand, the nose and throat are at times the chief cause, by closing the Eustachian tubes, of preventing ventilation of the middle ear; or severe inflammation is propagated through the tube into the middle ear, filling it with pus, mucus, serum, or blood. These cases, if attended to early, are promptly relieved, but if they become chronic and require protracted operations, the deafness, owing to the organic changes, can be but rarely relieved. The operation itself is a cause of perforation of the drum-membrane, or involvement of the mastoid cells, cicatricial formations, or a severe otitis media purulenta.

Three or four such cases have been operated upon during the months of January and February by the most celebrated laryng-

ogists of this city, with little or no improvement as to the deafness. The case we are about to relate is an exception.

E. G., aged 15, from the interior of Pennsylvania was sent to me in January, 1889, by his physician, who had been treating him for deafness of both ears, but especially the right. The lad had a dull, stupid look, with swollen nose and lip. His hearing on the left was four $\frac{4}{12}$ feet, and his right was only $\frac{6}{12}$ $\frac{\text{inches}}{\text{feet}}$, watch. On examination, it was found that he had a very large anterior hypertrophy on both sides, enlarged tonsils, and a very large pharyngeal tonsil, which filled very nearly the entire naso-pharyngeal space. The whole mucous membrane was inflamed, irritable, and covered with mucus of a gray, stringy nature. His physician was directed to employ for three weeks a wash of an antiseptic solution (alkaline) by a spray, applied by the doctor every day, and to place the boy upon tonics of iron, cod-liver oil, and alteratives of iodine, ammonia chlorides, etc. He came back in the course of a month, when his expression had entirely changed,—his eyes were bright, and he had a smile on his face, his nose was smaller, and he was able to breathe with ease, without contracting his nose. Above all, his hearing had improved in the right ear to twenty feet, and in the left to ten inches. The membrana tympani, which had been sunken and inflamed, had resumed a better curve, and the air entered the middle ear which was freer from mucus.

After a number of operations, with the use of Politzer's air-bag, charged with from ten to fifteen drops of ether, his hearing was again tested on March 7, when the following was the result: Right ear, $\frac{12}{12}$ feet; left ear, ten feet, $\frac{10}{12}$ feet. He was directed to still continue the wash and tonics until mild weather, and to return, if not entirely well, in three weeks, to give full time for the operated parts to heal and the parts to resume their normal condition.

In many instances we do not receive all the benefit from operations in these regions, owing to our not giving full time for the first class of operations to heal before attempting another series. This is sometimes the fault of the patient, in his great anxiety to get well and return home before the surgeon considers it advisable.

Often mischief follows the, too soon, exposure to cold air in the railroad-car, or a sudden change of temperature and its action upon the exposed and sensitive membrane.

THE USES AND ABUSES OF THE NEW ANTIPYRETICS.

By B. Frank Humphreys, M.D., Hawkins, Tex.

THIS subject has been discussed exhaustively through the columns of various medical journals, and in none, perhaps, more carefully and thoroughly than in the Therapeutic Gazette, which so ably leads the procession in the grand march of therapeutic progress. It may, therefore, seem not only unnecessary, but possibly a little presumptuous in the writer, to attempt the further discussion of this topic, which has been an interesting thesis, from time to time, of the most renowned clinicians known to fame. Nevertheless, I will venture to offer some additional remarks and collaborations, chiefly in relation to antifebrin, phenacetin, and antipyrin.

My experience with antifebrin is rather too limited and indefinite to inspire me with that confidence necessary to justify any positive conclusions with reference to the therapy of this drug. Its untoward effects on the hæmoglobin of the blood, like most of the aniline products, if long continued in large doses, result in organic changes by decomposition of the coloring-matter of the blood, as noted by Professor Germain Sée, who says he dislikes to use it much on that account, and remarks that his illustrious *confrère*, Dujardin-Beaumetz, goes on giving antifebrin regardless of the cyanosis produced thereby, and when the distinguished savant of the Paris faculty is thus confronted with the pathogenic effects of antifebrin, he smiles and says that antipyrin produces a rash; but Professor Sée shows that there is a great pathological difference between the eruption which occasionally accompanies the use of antipyrin and the hæmoglobinuria which results from the free or long-continued use of antifebrin. This untoward effect of acetanilide on the blood has made me somewhat cautious in its use here where the malarial infection itself is too prone to produce hæmoglobinuria, without the aid of a drug whose tendency is to precipitate such an undesirable result.

Nevertheless, I have frequently used antifebrin with satisfaction as an antipyretic, and in certain painful neuroses, in which it has been found useful or palliative. It is not so conveniently administered as antipyrin; especially is this the case with children and not a few adults, who soon tire of pills and capsules, while the alcoholic solution is often objection-

able for obvious reasons. The spirit of nitrous ether with antifebrin produces a beautiful, perfectly transparent solution, which remains unchanged, so far as I have observed, for a considerable length of time, with a single exception, in which the solution, several weeks after it had been prepared, had changed to a clear, bright scarlet color. The cause of this reaction was not investigated, as I then supposed it was probably due to a trace of nitrous acid in the ether, although Kohn, in *Rundschau* (Prague), observes that while an aqueous solution of antipyrin is changed to red, by the addition of a very small quantity of perchloride of iron, and to a blue-green by 1 to 100,000 of nitrous acid, antifebrin gives no such reaction with the reagents mentioned (*National Druggist*, March 4, 1887).

Methacetin is the most recent addition to the new antipyretics. It is said to be analogous to phenacetin, and has been tested to a limited extent by Dr. Franz Mahnert, assistant to Professor Von Jaksch.

Phenacetin (para-acetphenetidin) is also a recent introduction to this class of remedies. It is an acetyl compound of phenetidin,—*i.e.*, of ethylic ether of paramidophenol,—and it is, therefore, analogous to antifebrin (acetanilide). It is only slightly soluble in hot and cold water, nor is it any more soluble in the gastric juice or pancreatic extract. Still, as has been shown by experiments and observations recorded, it is absorbed slowly in some way, and exerts a powerful influence on the human system by its antipyretic and antineuralgic action (*Wiener Med. Woch.*, 1888, Nos. 26, 27). Dr. G. Kobler, assistant at the medical clinic of Professor Von Bamberger, at Vienna, under whose direction he experimented, was the first to observe the effects of phenacetin as an antipyretic remedy. Fifty cases with high temperature came under his observation. Dr. Kobler makes the following remarks with reference to the properties of this new antipyretic:

A specific influence on the course of the disease itself was never observed.

But phenacetin in every case was borne well without any toxic or even disagreeable effects.

The reduction of temperature is, as a rule, pretty rapid, while the subsequent rise is comparatively much slower. Large single doses of phenacetin have a decidedly more energetic effect than small doses frequently repeated.

There was never any cyanosis or collapse, such as is not infrequently seen during the administration of some other antipyretics. Even in the ten cases of pneumonia treated with phenacetin there was no deleterious action on the heart, which we often meet with in the course of this disease.

Summarizing his experience, Dr. Kobler comes to the following conclusions:

1. Phenacetin is a very efficacious antipyretic.

2. It has no disagreeable or deleterious effects, such as cyanosis or collapse.

3. It produces decided euphoria.

4. It is best administered in single doses of from 8 to 12 grains, instead of smaller ones given every hour or two.

5. The reduction of temperature after such a dose is from 3.6° to 4.5° F.

Dr. Hugo Hoppe, of Berlin, under the direction of Professor Albert Fraenkel and Dr. Paul Guttman, medical director of the City Hospital at Moabit, has collected notes of twenty cases affected with maladies in which there was pyrexia, nine of whom had typhoid fever. Dr. Hoppe's paper is a carefully written thesis, very elaborate and minute in clinical notes, taken with reference to the therapeutic action of phenacetin. He arrives at very similar conclusions to his predecessor, Dr. Kobler; and, although neither of these clinicians observed any untoward effects of the drug, even in doses of from 15 to 30 grains, Dr. Paul Guttman afterwards informed Dr. Hoppe that he had observed a severe chill in a child during the subsequent rise of temperature after the exhibition of phenacetin, without stating, however, the quantity administered or age of patient. Now, it is alleged that in Kobler's fifty and Hoppe's twenty cases there were no rigors observed upon the subsequent rise of temperature. A reasonable inference, therefore, would be, that in Dr. Guttman's single case, the child had probably received a dose which "transcended the exclamation point," or it may have been a single exception to the action of the medicine as a rule.

Professor Guiseppe Cattani, physician to the Grand Hospital at Milan, has tried phenacetin in more than fifty different cases, mostly febrile diseases, and his reports are almost exclusively favorable. Of the many forms of disease in which he has used phenacetin to advantage is rheumatic endocarditis, in which, he says, it acts like a tonic by rendering the heart's action steady, even where a valvular lesion has been established, as, for instance, in a mitral incompetency. Professor Cattani, like Professor Dujardin-Beaumetz, thinks th

the analgesic property of phenacetin outrivals its predecessors. Dr. Gaiffé has found phenacetin of considerable benefit in nervous polyuria. He says the heart and pulse are never influenced by this drug. Drs. Cesari and Burani confirm most of the antecedent observations of others with reference to the action of phenacetin. Drs. Misrachi and Rifat (*Bull. Gén. de Thérap.*, June, 1888) contribute a clinical study of phenacetin, in which they also recommend the drug as an affective antihyperthermic and antinervine remedy. In children's practice they advise it rubbed up in some sugar, which, they say, totally disguises any taste or smell.

Professor Rumpf, of Bonn (*Berliner Klin. Wochenschrift*, No. 23, 1888), says that this drug, as now produced by the manufacturers, is almost chemically pure phenacetin, and that it has no disagreeable action whatever if given in doses not exceeding 45 grains per day. In doses of 15 grains daily, he says, it is absolutely harmless, and that there are no nausea and vomiting, no cyanosis and syncope, and no untoward symptoms in patients with high temperature.

The dose administered by Professor Rumpf was 15 grains, by which the temperature was reduced 3.6° to 5.4° F. within from two to four hours. In a case of pleurisy, for instance, the temperature fell from 104° to 99.2° F., and on the next day from 103° to 99° F. within four hours. Having found that 15 grains of phenacetine would in some cases cause the temperature to fall below the normal, Professor Rumpf advises that the dose given in febrile maladies should never be larger than 8 grains, although, strange as it may seem, even when given in doses of 45 grains, it is alleged that the drug never caused any nausea, vomiting, chilliness, cyanosis, or eruption of the skin; only profuse perspiration was observed in some cases.

Encouraged by the favorable results obtained by Hoppe, Heusner, and Dujardin-Beaumetz with the administration of phenacetin in cases of hemicrania and other forms of neuralgia, Professor Rumpf tried the drug, with regard to its analgesic property, in a great number of cases with uniformly satisfactory results, the dose in such cases being 15 grains. The effects of the medicament were observed in many cases within thirty or forty minutes after its administration, in other cases not until an hour or two had elapsed.

From a considerable clinical experience with this new candidate for favor, Professor Rumpf arrives at the following conclusions with regard to its therapeutic properties:

1. Phenacetin is an antipyretic of reliable action and certain effects, free from all untoward and disagreeable symptoms.

2. Phenacetin is to be recommended as an antineuralgic in 15-grain doses, viz.:

a. In all cases of vaso-motor neuroses.

b. In locomotor ataxia against the lancinating pains, and in cases of chronic neuritis against neuralgia.

c. In various cases of neuralgia, to soothe the pain at least. Professor Mueller, at the meeting of the Verein für Innere Medizin, at Berlin, July 2, 1888, in a discussion with regard to the merits of phenacetin, confirmed the observations of the authors detailed herein, and further added that its exhibition is never followed by cyanosis and methæmoglobinuria by daily doses of 75 grains or less. This statement, if found true by other observers, will prove to be a strong argument in favor of the claim that the drug is comparatively safe in large doses, and innocuous in medicinal doses.

Some distinguished English physicians have expressed a favorable opinion of phenacetin, corroborating the observations of the writers already mentioned.

Professor Dujardin-Beaumetz (*Le Semaine Médicale*, April 24, 1888) says, . . . "Phenacetin is a rival of antipyrin and antifebrin; in a word, it is an antipyretic and a nervous sedative. It is not unlikely that it is more active than either of the two agents just named. . . .

"I have tried it in doses of 5 grains, given in wafers, and I must say that I have observed—as others have done before—a considerable reduction of temperature in tuberculous, feverish patients, and in those suffering from typhoid fever. This reduction, which amounted to 5.4° F., in some cases is remarkably persistent, although the dose is comparatively small: it lasts from eight to ten hours. On the duration of the disease itself, the new remedy has no influence, just as the other antipyretics.

"Phenacetin is also a strong analgesic, more powerful in its action, perhaps, than either antipyrin or antifebrin. And it acts very rapidly, in spite of its insolubility in the gastric juice; about twenty minutes after its administration, its effects may already be observed.

"I will state in addition that phenacetin does not produce cyanosis, like antifebrin, and that, in contradistinction to the latter, its

presence in the urine may be detected ; ferric perchloride will turn red, and cupric sulphate will turn green, if added to urine containing phenacetin."

Professor R. Lépine, of Lyons, in a paper on typhoid fever, also expresses satisfaction with the effects of this new medicament. He says, however, after daily doses of 90 grains there is some headache and some cyanosis; but in doses of 45 grains he says it does not affect the heart, and produces neither cyanosis nor any other untoward symptom, except, perhaps, some sweating. He gives it in 8-grain wafers, of these six to eight a day. From the foregoing, it is to be inferred that the drug, in very large doses, or perhaps if long continued in smaller doses, may produce blood changes not very unlike the effects of antifebrin.

My own experience with this new remedy is very limited, but I have reason to believe that it will be found a convenient antithermic and analgesic remedy in cases where such medicaments are indicated, and probably it may be suited to cases in which the other antipyretics are not well borne. I have used only the 2-grain coated pill.

While I have not observed in the action of phenacetin any untoward symptoms, as is the case with antifebrin, neither have I observed, as a rule, the prompt response that so uniformly follows the exhibition of a suitable dose of antipyrin ; nor were the pills of phenacetin as acceptable to the patients, either children or adults, as the simple, convenient, and palatable solution of antipyrin in cold water.

Antipyrin, from its introduction six years ago up to the present time, has commanded not only the general attention, but almost the universal confidence, of many of the most distinguished medical authorities throughout the civilized world. It has been put to the severest and most impartial test in hospital and private clinics, resulting almost uniformly in a favorable verdict. No remedy of equal potency has, perhaps, been so extensively employed with so few disappointments or detrimental results. It has been resorted to in a variety of maladies, usually with satisfactory results. The literature on this single remedy would form a volume as large as the whole Pharmacopœia. Being comparatively innocuous in medicinal doses, also the most convenient, palatable, and doubtless the most prompt and efficient of the new antipyretics, and having maintained its brilliant reputation so long through divers lands and tongues, *antipyrin is the antipyretic par excellence, and deservedly stands at the head of this class of remedies, until something better shall be discovered.*

As an antithermic medicament, and as a remedy in painful neuroses due to obscure derangements of the central nervous system, I have for several years used antipyrin with such uniform satisfaction both to myself and to those who sought relief, that I have not felt inclined to experiment with other remedies not so well known and of doubtful utility, especially when great interests or even life itself was at stake.

In the *Nashville Journal of Medicine and Surgery* for October, 1888, in a contribution entitled "Ice-Packs in Cerebro-Spinal Meningitis," I have given the clinical notes, with comments, of an exceedingly violent attack of this malady in a lad 6 years old, whose temperature on my first visit was 105.5° F.,—a pyrexia quite unusual in this disease, inasmuch as only two of the ninety-eight cases analyzed by Dr. Githens had a like temperature (*Am. Jour. Med. Sciences*, July, 1867). The usual sedatives having failed to reduce the child's temperature, he was given about 10 grains of antipyrin occasionally, as seemed necessary, which not only promptly reduced the temperature, but it was equally valuable in "quelling those nerve storms," which seem to be one of the causes of death. I had not then seen the valuable paper of Guy N. Stephen, M.R.C.S., of the Cypress Medical Service, on antipyrin in epidemic cerebro-spinal meningitis (*Brit. Med. Jour.*, *St. Louis Med. Rev.*, June 30, 1888). The author thinks antipyrin has the good qualities of opium, ergot, belladonna, the bromides, and aconite in the direction of allaying the terrible pain, in influencing the course of the disease, and in warding off death. He does not insist that its action in these cases is by reduction of the temperature, and advises it in three 15-grain doses given in the course of an evening and night.

By the judicious administration of antipyrin to my little patient, with an occasional hypodermic of morphine and atropine, liquid diet, glycerin enemata, ice-packs to the head day and night, etc., the child was convalescing after four days of constant watching and careful treatment. He made a perfect recovery, and to antipyrin is due part of the credit.

It is not the object of this paper, however, to give even a synopsis of the multifarious symptoms and maladies in which anti-

pyrin has seemed to be useful. The modern medical literature of all countries abounds in reliable clinical records of its apparent usefulness in a great variety of diseases. This being the case, there is reason for believing that antipyrin, like quinine, has been frequently abused, without the proper discrimination in its therapeutic application. So generally are its virtues recognized by the profession, when judiciously administered, many of our patrons having witnessed its marvellous effects, keep the drug in their houses as a companion to their bottles of calomel and quinine, all of which they use more or less frequently without a correct knowledge of the therapeutic indications for the use of these potent drugs, which are so powerful for good, if properly administered when indicated; but, on the contrary, are equally powerful for evil, if given without an exact knowledge of the pathological condition of the patient, and this necessarily implies a knowledge of pathology and therapeutics, two of the most intricate and important branches of the medical sciences, without which the administration of such drugs is not only presumptuous but extremely hazardous.

Recently a somewhat feeble and delicate gentleman of this place was suffering from neuralgia. He was advised by an acquaintance, not a physician, to take a dose of antipyrin. He took 20 grains, or, perhaps, more. Soon afterwards he was prostrated and completely helpless. His symptoms, he said, were indescribable. This was his first experience with the drug, and he says it will probably be his last. His officious acquaintance is addicted to the habit of prescribing for people who complain of feeling unwell, and says that his family physician, a prominent practitioner in a well-known town, where he formerly resided, told him to give antifebrin or antipyrin whenever any one was suffering from headache. Surely any physician is justly reprehensible for distributing broadcast such empirical advice concerning this or any other potent drug, for reasons obvious to every intelligent reader of current medical literature.

Now this leads me to refer briefly to certain conditions in which antipyrin, and perhaps all other antipyretics of similar derivation, are inadmissible:

1. In all cases of cardiac weakness.
2. In diphtheritic affections in which there is evidence of myocarditic lesion.
3. After exhaustive hemorrhages.
4. During menstruation and in dysmenorrhœa.
5. In catarrhal pneumonia generally, and in lobar pneumonia when there is œdema of the lungs,—heart failure.
6. In the latter stages of tuberculosis.
7. In all cases of great debility and exhaustion, and in the latter stages of long-continued fevers.

It is believed that the foregoing contra-indications with regard to the administration of antipyrin and similar medicaments will receive the approval of physicians generally.

Dr. Gœtze (clinic of Professor Rossbach, of Jena) recommends that in every new case the extent of the effect of antipyrin should be first ascertained by the administration of small doses.

Dr. Demme, Professor of Medicine at Berne, says, "In cases of serious diphtheritic affections, the use of antipyrin has to be dispensed with on account of the danger of weakening the heart's action and the not infrequent myocarditic lesion that exists in such cases. . . . The use of antipyrin must also be forbidden in cases of very delicate persons and those who have a decided weakness of the heart."

Dr. Léon Arduin, of the Paris faculty ("Contribution à l'Étude thérapeutique et physiologique de l'Antipyrine"), observes: "The use of antipyrin must not be thought of in the case of persons having a weak heart, and it is advisable to treat very emaciated individuals with small doses only. . . . Similarly small doses are to be administered in cases of consumption. . . . In order to be entirely on the safe side, it is advisable to determine, in the first instance, the susceptibility of the patient for antipyrin, by the administration of small doses to every new case taken in hand."

Dr. Huchard administered 16 grains of antipyrin to a woman suffering from a severe dysmenorrhœa, which was promptly arrested, but accompanied by shivering and cyanosis, with a tendency to syncope, all of which gradually passed off in the course of half an hour. He has noted the same effect, but less marked, in two other cases, in which he had prescribed the drug under similar circumstances (*London Medical Press*).

I will remark, in this connection, that I have recently observed a somewhat singular circumstance follow the administration of antipyrin, which may be either an effect or coincidence; at any rate, it is new to me. A young lady (of unquestionable virtue), whose

menstrual periods had always been regular, was suffering from a severe attack of migraine about the time the menstrual molimen should make its appearance. As quinine had previously had an untoward effect upon this patient, none was given to her. Bromide of potassium and morphine, bromo-caffeine, and similar remedies gave only temporary relief. At this stage, after nearly a week of suffering, I administered 15 grains of antipyrin, which so completely abolished the pain that the patient was enabled to sit up half of the afternoon. A like dose was administered early next morning, followed by complete immunity from any subsequent attacks. But, strange to relate, the catamenia never appeared at the accustomed time, nor at the next two periods, two months later, which is at this writing. Can it be that antipyrin, on account of its hæmostatic property, was the cause of the suppression, or was it simply a coincidence, the suppression being accompanied by the migraine, which was itself merely a symptom of the functional derangement still existing? The novelty of the case seems worthy of note.

Iso-nitroso-antipyrin is a term applied to a combination of antipyrin and the spirits of nitrous ether containing free nitrous acid, the incompatibility having been observed first, perhaps, by the well-known discoverer of antipyrin, who suggested the term. Professor E. B. Stuart (*Western Druggist*, December, 1888) has found that the quantity of nitrous acid necessary to produce this reaction is so small that he has not been able to determine the lower limit. With a half-per-cent. alcoholic solution of antipyrin, he has observed that one-fifty-thousandth part of nitrous acid will give a strong reaction. Professor Potter has also made similar observations, and has shown by chemical formulæ the transformation which takes place. Following in the wake of these scientific observers, many others, less distinguished, and moved perhaps more by ominous apprehensions than by science, have been sounding the alarm concerning this "deadly compound," so-called, and it is amazing how many flies, cats, and dogs they have suddenly exterminated by this comparatively innocuous mixture, if we are to give them credence for their scientific exploits.

Per contra, Professor Horatio C. Wood and Dr. John Marshall, of Philadelphia (THERAPEUTIC GAZETTE, February, 1889) relate a number of physiological experiments which they have recently made with iso-nitroso-antipyrin, prepared by adding the calculated quantity of potassium nitrite to an acidulated aqueous solution of antipyrin. The liquid became at once bluish green in color, and in a few minutes there was an abundant production of crystals. These were collected on a filter, thoroughly washed with cold water, and allowed to dry on bibulous paper at ordinary temperature.

In determining whether the iso-nitroso-antipyrin possessed toxic properties, it was administered under various conditions to dogs and rabbits, but in no case, as the experiments show, were the slightest untoward effects observed.

Although as much as 1 gramme (15 grs.) of iso-nitroso-antipyrin was given to a dog, "no deleterious result, nor, indeed, any change in the behavior of the dog could be noticed." To another, 1 gramme was given, and repeated after the lapse of an hour; and, although the dog was under direct observation for four hours after this last portion was given, not the slightest change in his well-being could be noticed.

Experiments were made with antipyrin and c. p. ethyl nitrite, with the usual amount of alcohol and water to effect its solution, in the dog previously used in Experiment 3; no ill effects resulted. Three hours later, 1 gramme of antipyrin, in a separate solution, and ½ cubic centimetre of c. p. ethyl nitrite in the requisite quantity of alcohol and water, were given to the same dog; no ill effects resulted.

Dr. G. Evans, of Aberdeen, Miss., in the same issue of the GAZETTE, states that he has made similar experiments with antipyrin with sweet spirits of nitre in two experiments upon dogs, without any ill effects upon them. Dr. Evans further alleges that he has at various times administered 15 grains of antipyrin and half a drachm of sweet spirits of nitre mixed, not only without any untoward effects but with apparent benefit, to patients having continued fever.

Finally, from what has been collated from various reliable sources, and condensed as much as possible to present the views of the authors in an intelligible form, together with the writer's own limited observations, the rational and impartial conclusion seems to be with our present knowledge, that while these new medicaments are usually reliable and potential means for the reduction of high temperature and the mitigation of pain, they are nevertheless, agents capable of producing more or less injury, if administered when contraindicated, or too freely for a con-

erable length of time. It should be remembered also that it is an open question whether or not any real benefit results from the use of remedies which merely control symptoms without removing the cause.

Nevertheless, it seems to be the prevailing opinion among clinicians—an opinion the writer is inclined to share in common with others—that some of these new medicaments are not only palliative and seemingly of considerable practical benefit in many cases, but in some instances apparently curative, as has already been shown. At any rate, such is believed to be the opinion generally entertained with regard to antipyrin, at least, which seems to have a record radiant with unequalled service in the past, casting a halo of brightness on its future pathway.

ARSENITE OF COPPER AS A REMEDIAL AGENT.

By John Aulde, M.D., Philadelphia, Pa.*

During the month of September last a brief note appeared in one of the Philadelphia medical journals which was intended as an epitome of my experience with the use of arsenite of copper in the treatment of bowel affections, but more especially in cholera morbus. In recounting the results of my observations, I referred incidentally to the fact that the remedy had been called to my attention by Dr. Boardman Reed, of Atlantic City, N. J., well known to the readers of this journal, who candidly admitted its superiority for the relief of cholera morbus and allied affections. An extract from the publication will serve to indicate my earlier observations, and what I have to say at present will be confirmatory of that report, together with a record of some illustrative cases, showing more fully its therapeutic value. The following is the extract: "It [arsenite of copper] was used in probably twenty cases of bowel-troubles, in patients ranging from 1 year up to 60 or more, and varying from simple colicky pains to diarrhœa and vomiting of several days' duration, and one case of acute dysentery accompanied by profuse bloody discharges from the bowels, and in every instance the treatment proved eminently successful; not a single failure occurred, and, as a rule, the pain and tenesmus subsided after the first hour, or after the taking of the first five doses" (*Medical Register*, September 8, 1888, page 230).

In the following summary my remarks will be confined to such cases of bowel affections as are most frequently seen by the physician during the summer season and to cases of typhoid fever.

It will be appropriate, however, to say a word regarding the composition of the remedy, which will be useful to those who feel disposed to investigate the subject for themselves. This information should include the method of preparing the drug, as well as some reference to its pharmacology.

Arsenite of copper is known in commerce as Scheele's green, and is a fine, green powder, composed of arsenious acid and oxide of copper, one part of the former to two of the latter. It is soluble in ammonia and nitric acid, and yields crystals of arsenious acid by sublimation. Cupric arsenite differs from cupric aceto-arsenite, which is variously known as Paris green, Schweinfurt or Brunswick green, Vienna or emerald green, the pigment used for staining wall-paper, dress goods, artificial flowers, and other classes of millinery. Paris green is recognized as an active poison, and is frequently used by farmers in the rural districts for the destruction of potato-bugs and other insects. Its well-known activity has led to its use by sufferers from melancholia for the purpose of terminating life, while its use as a pigment has frequently been followed by cases of arsenical poisoning which were often difficult to understand. Paris green contains a much larger proportion of arsenic than Scheele's green, which accounts for the active toxic symptoms, while the presence of acetic acid probably assists materially to increase its diffusibility when taken into the system or applied externally.

Cupric aceto-arsenite contains 6 parts of arsenious acid, 2 parts oxide of copper, and 1 part of acetic acid, and may be identified by the usual chemical processes, and when heated in a test-tube, gives off fumes of acetic acid, crystals of arsenious acid being deposited, the residue left being the oxide of copper.

For medicinal use, the arsenite of copper is prepared as follows: To one part of arsenite of copper in fine powder, a sufficient quantity of sugar of milk is added, and trituration begun; additions are made of sugar of milk, trituration being continued, and sugar of milk added sufficient to make the quantity up to

* Demonstrator of Clinical Medicine and of Physical Diagnosis in the Medico-Chirurgical College of Philadelphia.

one hundred parts. One grain of this triturate, therefore, contains one one-hundredth grain of cupric arsenite, and for all practical purposes this method of preparation is sufficient, as a single grain will readily dissolve in water, and the division into small doses is thus more conveniently secured. When desired, this form of powder may be prepared in the form of tablets, containing one grain each, by which each tablet is made to contain definitely one one-hundredth grain. Particular attention is here given to the method of preparation, for the reason that my observations have been confined to the use of arsenite of copper clinically in quantities not exceeding one one-hundredth grain, and, when prepared in the form of tablets, its administration is extremely simple. A single tablet containing this amount should be dissolved in from four to six ounces of water, the dose of the solution being a teaspoonful. The quantity thus prepared will be sufficient for from thirty to fifty doses. Of this solution the patient is directed to take one teaspoonful every ten minutes for an hour, after which the remedy should be repeated at less frequent intervals; as a rule, however, these intervals do not exceed one hour, and the medicine is continued regularly while the patient remains awake.

By a simple mathematical calculation it will be found that the exact quantity taken at each period approaches the infinitesimal, and some of my friends have been disposed to look upon the matter with incredulity. References in the medical journals to my report, shortly after its publication, indicated that it was looked upon more as a curiosity in medical literature than an addition to our therapeutic resources. A medical friend, more sceptical than the rest, was induced to accept a small sample of this powder, to be used probably in the first emergency, when nothing else was at hand, or when the patient was suffering agonizing torture, while waiting the delay of the druggist. It so happened that, within a week or ten days, he was summoned to attend one of his patients who had been subject to frequent, but somewhat irregular, attacks of intestinal colic, which, on previous occasions, had given him no end of trouble. All remedies had been tried, but with varying degrees of success, and at times these attacks were so serious that the patient was laid up for several days, when hypodermic medication afforded the only means of relief. On the occasion referred to, the symptoms pointed to a severe and prolonged attack, and in a moment the idea flashed upon him that this case would furnish a crucial test of the therapeutic value of the remedy. Without any hopes of witnessing good results from its use, the solution was prepared as above directed, and the patient instructed to take teaspoonful doses at intervals of ten minutes, while the doctor in the mean time sat down to consider the propriety of following up the old methods. His surprise may be imagined, when, after taking the second dose, the patient expressed herself as feeling somewhat relieved, and at the expiration of twenty minutes, or after the third dose had been swallowed, the pain and all distressing symptoms had so far subsided that further medication seemed unnecessary, although the medicine was continued until near the end of the first hour.

The pharmacology of cupric arsenite will be written hereafter; our present knowledge of its physiological action must be largely hypothetical. That it partakes of the alterative character of arsenic, and like that remedy, when used in small doses, presents the characteristic features of a sedative to mucous tissues, will be apparent from its value in gastro-intestinal derangements. Whether arsenic alone would be sufficient to overcome acute affections like cholera morbus is a question which would probably be answered in the negative, but when combined with the oxide of copper in the proportions given above, we are warranted in assuming that the combination possesses astringent as well as sedative properties.

Clinical observation confirms this theory, and experience has abundantly shown its efficiency when administered in small doses in nearly all classes of acute intestinal affections.

The claim will be put forward that the dose is too small to produce any marked effect. By some the gratifying results which follow its use will be said to be due to its selective action, by others it will be pointed out as a clear case of special affinity, but it is doubtful if either explanation does more than serve as a cloak for ignorance; and the minuteness of the dose prevents our accepting it as a case illustrating the substitutive action of a remedy. Evidently it illustrates a factor in the treatment of disease which is too frequently overlooked,—viz., that the effect upon the economy of the exhibition of drugs is of a twofold nature; in other words, that it is a resultant dependent upon the presence of disease and the exhibition of the drug. If the disease were absent, the drug would not produce any appreciab

effect, but with the disease the medicine produces an effect in accord with its power over the nervous system. An illustration may be of value in clearing up this somewhat complicated problem, and we may select for the purpose the case of peritonitis. The late Dr. Alonzo Clark, by the exhibition of massive doses of opium, showed the remarkable tolerance of the system for that particular drug. A patient suffering from peritonitis was permitted to take sufficient opium in the course of twenty-four hours to kill half a dozen men, and apparently no bad results attended upon its use. The modern use of salines in like conditions depends upon a different principle, but the use of atropine in combination with morphine previous to the inhalation of chloroform or ether, is similar to the use of opium in peritonitis. The timely administration of atropine and morphine will prevent shock, but it is doubtful if the early administration of opium would prevent peritonitis, although it was at one time believed that it exercised a favorable influence upon the progress of the disease. Now these influences, whatever they may be, must be effected through the nervous system, and it is not beyond the range of possibilities that in such manner the arsenite of copper may produce its effect in the treatment of inflammatory affections of the alimentary tract.

The season of the year is approaching when we shall be called upon to meet such cases as are benefited by the remedy under consideration, and I desire to afford my brethren in the field an opportunity of introducing it into their practice; those who are unable to procure the remedy in the form of powder or tablets, will be cheerfully supplied with samples without expense until such time as the preparation can be placed upon the market, if there is a demand for it.

Clinical Applications.—Before me I have a list of a dozen or more cases that have occurred in practice within the past month, which I should feel warranted in classing as typical instances to be found in general practice. An account in detail would be tedious, and, besides, is unnecessary; so it will be sufficient to pass them in review, pointing out some of the most common symptoms presenting.

Elsie is a little girl of 4 summers, and has not been eating very regularly for a week or so, but only within a few days has there been any trouble with the bowels. The stools are frequent, yellowish, and slimy, and with each movement there is considerable pain; the tongue is coated, skin sallow, and the whole appearance indicates a condition which may be expressed in one word,—weariness,—but she does not show any tendency to sleep. The probabilities are strong that we have to deal with a malarial element, but attention is first directed to the condition of the bowels by the administration of arsenite of copper. The child is better the next day; in fact, the mother says she was lively after an hour or two, and has been quite bright, and offers to play with the other children. Antiperiodic treatment followed, and resulted in complete recovery.

Mr. T. is a man over 50, a farmer, and has been suffering from diarrhœa for several days. All the domestic remedies have been tried in vain, but the use of arsenite of copper, one tablet during the evening of the call and another the next morning, was all that was required to correct the difficulty, although he said he was quite well the next morning after taking the medicine for the evening previous.

John H. is a hard-working young man, a grave-digger, and for some days now he has been very much depressed; there is a loss of appetite, abdominal pain, weakness, and sleeplessness, and a slight rise in temperature, with a pulse of 120; the stools are watery, offensive, and have been as frequent as ten in the day. Everything points to typhoid fever, but, as the arsenite of copper is a useful remedy in that disease, he is placed upon that, and is given a supply sufficient to last two days, at which time he is to return unless he is much better. He visited the office about mid-day, and went immediately home and began taking the medicine, and was able to go to work on the following morning, although still weak from the effects of the diarrhœa.

Henry is a boy about 9 years of age, who has been under domestic treatment for the past few days for looseness of the bowels. He has great pain, frequent movements from the bowels, is languid, no appetite, but great thirst, and complains all the time of headache. Has had nose-bleed the afternoon of the day the mother called, and she is greatly exercised for fear that the boy is taking typhoid fever. The vomited material is of a grayish, slimy appearance, and he has slept but little for several nights. For that evening this patient was to take one tablet of the arsenite of copper between eight o'clock and bedtime, and in the morning he was to take the remedy again in the same way. The under-

standing was that, should the boy's condition not appear to be improved, I was to be advised; but no tidings were received until the next day, when the mother called, and said Henry was all right when he awoke the morning after taking the medicine. The real cause of this attack I have not been able to determine, as an older child had a similar trouble several months ago, but was relieved in the same manner as this one, except that recovery was less prompt. He was confined to the house for several days, but had been laid up for some time when I first saw him.

The value of arsenite of copper in the treatment of typhoid fever should not be overlooked, although I do not advance it because of its germicidal or antiseptic properties, but on account of its great value in the treatment of non-specific bowel-troubles which are so common at all seasons of the year. In the early history of this disease it is often extremely difficult to determine the real character, so frequently is its oncoming masked by complications. The patient will sometimes complain of supra-orbital neuralgia and nothing more; another time it will be apparently a clear case of malarial cachexia; and, again, it will be simple nervousness of which the patient complains; but whenever there is the least indication of derangement of the bowels, or if there is an elevation of temperature, along with acceleration of the pulse, and other symptoms confirm the suspicion, I always take the precaution to administer the arsenite of copper, confine the patient to bed, upon a restricted or a milk diet. Following up this plan for a year, I have seen the best results, and think it is not beyond the bounds of truth when I say that many cases which ordinarily would have advanced to typhoid fever, in the course of a few days, have taken a decided change for the better, and the danger has been averted. The symptoms of this malady are so well known that it would be a waste of time to enumerate them, and it will be sufficient to say that some of these suspected cases have continued for as long as a week before the disappearance of the elevated temperature in the evening. That they were of malarial origin may be suspected, but in a number of instances this matter was taken into consideration, and decided in the negative, because lately they have all been subdued by the use of arsenite of copper alone, except where there was great prostration, owing to the delay in consulting the physician, when nux vomica in small doses was added to the treatment.

The method of administration in typhoid consists in the use of a single tablet containing one one-hundredth of a grain daily, the medicine to be distributed throughout the day by solution in water. In cases as ordinarily seen, its addition to other treatment is always attended with the best results; the temperature shows a favorable change, the pulse is less frequent, there is an improvement in the abdominal pain and in the frequency of the stools, and vomiting is controlled better than by the use of almost any other remedy. When this drug is employed, it has always seemed to me that the need for other remedies was largely superseded by it, the treatment of the disease being for the most part symptomatical, and it is with no little satisfaction that I offer it to the medical profession as an adjuvant to our therapeutics in this affection.

4719 FRANKFORD AVENUE.

SALICYLIC ACID IN THE TREATMENT OF MALIGNANT SCARLATINA.

DR. SHAKOWSKI writes in the *Revue Mensuelle des Maladies de l'Enfance* for June, 1889, that he has administered salicylic acid with the greatest success in one hundred and twenty-five cases of grave scarlatina occurring in children, the mortality being reduced to three and a half per cent. Ordinarily his method of administration was in the form of a mixture consisting of 1 part of salicylic acid to 75 parts of water, and 30 parts of syrup of orange-peel, a teaspoonful of this being given every hour during the day and every two hours during the night. He writes that under the influence of this remedy the temperature is rapidly reduced, in certain cases, even at the end of forty-eight hours, the temperature falling four degrees. Habitually all traces of fever disappear after the tenth day of the disease. Nevertheless, the author advises to prolong the treatment for some time longer than this in progressively decreasing doses, so as to avoid any danger of relapse. Through the use of this remedy the author believes that he has avoided the most serious complications of scarlatina, such as uræmia, anasarca and diphtheria. He claims that this medication will only be ineffectual when given too late,—that is, after the fourth day of the disease, or when there exists some grave chronic complication.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

ANÆSTHESIA.

THE subjects of selection and methods of use of anæsthetics, the danger of anæsthesia, and the treatment of the accidents which occur during it, have been so much discussed, indeed, so hackneyed, that we almost feel like apologizing for alluding to it. The matter is one, however, of the greatest importance, and the reporter of a case of death from ether, in the *New York Medical Journal* of May 18, held that the knowledge of physiological therapeutics has not yet been thoroughly diffused through the rank and file of the profession. In this case a middle-aged Frenchman, who had been suffering from tubercular disease, with albuminous urine, and aortic and mitral systolic murmurs and feeble heart-sounds, was given ether with the intention of the performance of Syme's amputation. A few moments after etherization was commenced the respiration faltered, and the patient became deeply cyanosed. This somewhat alarming condition quickly passed away, and five minutes later the assistant having the pulse under observation suddenly announced that it had ceased. "Immediately hypodermic injections of brandy, ether, and sulphate of atropine were given; amyl nitrite was applied to the nostrils, artificial respiration was practised, and the head and shoulders were depressed by elevation of the foot of the table; but all was in vain; the patient was dead."

According to the surgeon in charge who reports the case, the death was the result of syncope, and largely the outcome of the diseased condition of the heart, which was found at the autopsy to have a completely adherent pericardium, atheroma of the aorta, and stenotic mitral valve. The kidneys were also in a condition of advanced contraction.

In the first place, it is essential that a case like this be not allowed to go upon record as one of death due to ether. We doubt very much the wisdom of attempting a severe surgical operation like amputation of the foot in a man who has disease of the kidneys, disease of the mitral and aortic valves, and the other numerous organic ills which affected this Frenchman. If an operation was justifiable at all in such a case, both the surgeon and patient should appreciate the excessive risks, and no therapeutist should charge the death against the anæsthetic. The peculiar greatness of the danger in the case becomes manifest when the selection of the anæsthetic is thought of. The condition of the kidneys strongly contraindicated the use of ether; the clinical evidence which we now have being enough to demonstrate that chloroform is safer than ether in cases of renal disease, unless the heart-muscle has undergone secondary degeneration. This is probably because the amount of chloroform required to produce anæsthesia is so much smaller than that of ether that less strain is thrown upon the organ that eliminates it, hence the diseased kidneys are less irritated by chloroform than by ether. On the other hand, in the case under consideration the condition of the heart evidently contraindicated the use of chloroform; in fact, both ether and chloroform were contraindicated, and nothing but the gravest necessity could justify their use.

It is especially, however, to the treatment employed that we want to call attention, and we have no hesitation in affirming that if the patient had any chance of recovery at all, such chance was destroyed by the methods used for his relief. Suppose a doctor, having a case of opium-poisoning to deal with, were, for the purpose of relief, to administer morphine hypodermically, what

would be the judgment of the profession as to the method? Evidently that it was a madness. But here we are told that hypodermic injections of ether and brandy were given. Probably almost every one in the profession would agree with us in believing that the use of hypodermic injections of ether was improper; possibly only a minority would agree to the statement that the administration of the brandy was almost, if not quite, as dangerous. Ether and alcohol are, however, chemically almost identical; physically, except in the matter of volatility, they are exceedingly alike, and in their relations to the human organism they seem to differ only in so far as one is more volatile, and therefore more quick and more fugacious in its action than the other. Each primarily stimulates and secondarily depresses the heart, and we believe that in accidents of etherization the administration of alcohol is equivalent to the administration of more of the poisonous agent. This conclusion rests also not simply upon *a priori* argument. As long ago as 1883, R. Dubois, in a series of experiments made upon the lower animals, found that the free administration of alcohol intensifies the influence of chloroform and lessens the minimum fatal dose. Certainly alcohol and ether are more nearly equivalent remedies than are alcohol and chloroform.

PERSONAL DISINFECTION IN CONTAGIOUS DISEASES.

A POINT which appears to us of considerable practical value, and which has, doubtless, suggested itself to many physicians attending contagious diseases, and with almost equal certainty has but seldom been acted upon, is brought again to our attention through an article published in the *Medical Record* for June 22, 1889, by Dr. L. Mervin Maus, of the United States Army. We can now scarcely deny the germ origin of such diseases as diphtheria, scarlet fever, and measles, and it is further well established that the spread of these diseases is due to a material contagion, which, in the case of scarlet fever, is almost confined to the desquamated particles of the epidermis. It is well established that the contagiousness of scarlet fever increases with the onset of desquamation, and it is surprising, since the contagious matter is in all probability located in these desquamated scales, that the disinfection of the skin of the patient has not become a routine practice in the treatment of this disease. Unfortunately, one of us is at present passing through an epidemic of scarlatina in his own family, and there the first thought was to endeavor to protect the other members of the family by a disinfection of the skin of the patient, employing the use of corrosive sublimate in 1 to 1000 solution. In all probability this process was not inaugurated sufficiently soon, and did not entirely prevent the spread of the disease. It is known that very close approach to a scarlatina patient, or more or less direct personal contact with the patient, is required for the spread of the disease. If we could only thoroughly disinfect all the surroundings of the patient, we might hope, then, to do away with the spread of the disease, besides greatly reducing the necessity for prolonged isolation. Dr. Maus publishes the following rules as a preventive measure for the extension of this disease, and states that his practice has been founded on personal experience, and so far has been entirely satisfactory. He even states that he believes that we can through the employment of this method of treatment ignore isolation, in cases of mild scarlet fever, and ordinarily permit patients to join the family circle in ten days to two weeks.

1. Sponge the patient thoroughly morning and evening with a tepid solution of corrosive sublimate, 4 to 1000, as soon as the eruption makes its appearance.

2. Wash the hair once daily with a solution of the corrosive sublimate, of the same strength, and also a solution of borax, 1 to 250.

3. Disinfect the urine, fæces, and expectoration, also the discharge from the ears and nose, if there be any. A solution of the bichloride, 1 to 1000, is best for this purpose.

4. As soon as the patient is permitted to leave the bed have the body washed with warm water and soap, then sponged with the 1 to 4000 bichloride solution, wiped dry, and anointed with the following ointment:

℞ Sodii biboratis,
Zinci oxidi, aa ʒiv;
Ol. gaultheriæ, ʒss;
Vaselini, ℥iv.

The hair should be thoroughly washed with the bichloride and borax solution.

5. The patient is then to be enveloped in fresh and clean clothes throughout, and

lowed to leave the sick-room if his condition otherwise admits of it.

6. The bed-linen, soiled clothes, towels, etc., should be placed in a suitable sublimate solution and boiled, and the room well disinfected with sulphur. The sulphur candles are very convenient, and the disinfection should be repeated the second day, as the germs are very tenacious of life.

7. Require the nurse or attendant to keep the hair, face, and hands well disinfected during attendance, and to likewise make a complete change in his or her garments on date of the disinfection of the sick-room.

8. Continue the provisions of the third and fourth rules once daily until desquamation is complete.

NITRATE OF SILVER IN PURPURA HÆMORRHAGICA.

CERTAIN authors divide purpura into two forms,—the sthenic and asthenic,—a distinction which may be of service in furnishing therapeutic indications. The sthenic form is generally recognized by the pulse and the general state of the patient, and it may be imagined that in this form the walls of the capillaries are ruptured, without any alterations in their structure, on account of the exaggerated pressure in the circulatory system. In this form, reducing treatment is evidently indicated, and it is claimed that diminishing the blood-pressure will produce curative results. By far the greater number of cases of purpura hæmorrhagica, however, are of the asthenic or cachectic form, of which the termination is so often fatal. In this form there is more or less diminution in the red corpuscles and the solids of the blood, with augmentation of the white corpuscles, the great danger being in the incessant tendency to hemorrhage, which finally leads to fatal prostration. In such cases the state of the patient calls for an improvement in the health of the patient, and to the building up of his strength rather than to depletion. As a consequence, vegetable acids, especially citric acid, mineral acids, hæmostatic astringents, all occupy the first rank as remedies which are indicated; ergot also, in subcutaneous injections in the form of ergotine, may likewise prove efficacious. To this list of remedies Dr. V. Poulet (*Bulletin Général de Thérapeutique*, May 30, 1889) would add nitrate of silver, since he believes that the admirable results which this remedy produces in the treatment of purpura would almost warrant attributing to this remedy the possession of some specific properties. In support of this view, Dr. Poulet reports two cases of purpura, which, he stated, were taken from his record of numerous others. In the first of these the hemorrhage resisted the most varied and energetic forms of treatment, such as hypodermic injections of ergotine, tamponing the nasal passages, etc., and finally yielded to the internal administration of the nitrate of silver. In the second case, the remedies employed were less numerous, but equally fruitless; and here also nitrate of silver was especially efficacious, for, in a short time, all tendency to the formation of purpuric effusions disappeared and the tendency to hemorrhages was entirely overcome. Dr. Poulet believes that nitrate of silver produces this effect in these affections by its action on the vaso-motor supply of the capillaries. He administers 1/6 of a grain of nitrate of silver twice daily in pill form, taking care to give it at least half an hour after eating.

VIRGA LATIFOLIA—A NEW DIURETIC.

IN the *Revue Générale de Clinique et de Thérapeutique* for May 30, 1889, Dr. Mascarel writes that the leaves and flowers of the solidago virgaurea (*Virga latifolia*) possess marked diuretic properties. He gives a tablespoonful of the powder mixed up with a raw egg and a little sugar on the first day. The second day he gives the same quantity morning and evening, and goes on increasing for a week until at the seventh day seven eggs and seven tablespoonfuls of the powder are administered, together with a little castor-oil from time to time to combat constipation. This treatment is claimed to produce marked diuresis in cases of heart-disease, even when other diuretics have failed.

In commenting on the above article, Dr. L. Roche writes (*Revue Générale de Clinique et de Thérapeutique*, June 13, 1889) that in 1886 Dr. Duché read an article before the Société Médicale de l'Yonne on the good effects of the virgaurea in different chronic vesical affections. He regarded it as one of the most active diuretics, and administered the drug in the form of an infusion of from 225 to 450 grains of the leaves in a quart of water, this amount to be taken by the tumblerful in twenty-four hours. At the end of forty-eight

hours it is stated that a marked diuretic effect is produced. Dr. Roche adds that he has likewise had considerable experience with this drug as a diuretic, especially in ascites from cirrhosis of the liver, where in his hands it has yielded valuable results. He does not think that the method recommended by Dr. Mascarel is any better than when administered in infusion.

The plant referred to above evidently belongs to the composite genus of solidago, of which solidago odora, or sweet-scented golden-rod, was formerly officinal, while the solidago virgaurea was formerly used as an astringent, and supposed to possess lithontriptic virtues. Like other members of this class, we can imagine that the plant referred to may be diaphoretic when given in warm infusion, and it is not unreasonable to suppose that it likewise possesses more or less diuretic properties. It is mentioned in this connection by Cazin and Bossu as a diuretic, but until recommended by Mascarel, who states that the advice was given to him by an empiric, it has never been recommended, as far as we know, that the leaves and flowers should be administered in bulk. In this country they are used, we believe, as a substitute for common tea.

SILICATE OF SODIUM.

As long ago as 1872, Dumas, and almost simultaneously Rabuteau and Papillon, became interested with the silicate of sodium and its powerful antiseptic properties, preventing both putrefaction and fermentation. Their results were confirmed by some other French writers, especially by Picot and Champouillon. Dubreil, Marc, Sée, and other French writers afterwards affirmed that the silicate was a very valuable remedy in the treatment of chronic urethritis, vaginitis, diarrhœa, and other mucous fluxes. The remedy has not, however, succeeded in working its way into professional favor. The cause of this seems to be indicated by the recent researches of R. Lowenhaupt, who, in his inaugural thesis, records a number of experiments, and reaches the conclusion that the silicate of sodium has practically no influence upon putrefaction; that the antiseptic power which it sometimes exerts depends upon the appearance of free soda in it, the soda having the power of dissolving the fungi.

EMPLOYMENT OF LOBELINE IN THE TREATMENT OF ASTHMA.

In the THERAPEUTIC GAZETTE for September 5, 1886, we referred to an article by Dr. Nunes as to the use of lobelia inflata in asthma. Dr. Nunes employed the tincture in doses of ½ to 1 ounce without ever meeting with an accident, and claims that the inertness of this drug in the hands of others is owing to the insufficient dose employed. At the recent Brazilian Congress of Medicine and Surgery, held at Rio Janeiro, Dr. Silva Nunes presented a subsequent article on the same subject, in which he stated that in the last two years he had continued to achieve good results, and attributed them less to the large quantity administered than to perseverance in the employment of the remedy. He has found, together with others, that the tincture of lobelia administered in this way will frequently produce vomiting. This effect he attributes to the disagreeable taste of the tincture rather than any specific emetic properties of the drug itself. He was, therefore, led to inaugurate a series of experiments with the active principle of the lobelia,—the alkaloid lobeline. Dr. Nunes commenced his experiments with the administration of lobeline in doses of 1/6 of a grain, given at long intervals, while all other treatment was suspended, and gradually increased the quantity given until 6 grains were given to asthmatics without producing any toxic effects. The tolerance for this large dose of lobeline, claimed to exist by the author in asthmatics, is attributed by him to the excited condition of the nervous system, in which he finds the primary cause of the asthmatic affections.

Lobeline, according to Dr. Nunes, may be administered subcutaneously without producing any local reaction, and he advises its use in this manner where an immediate effect is desired. The author publishes tolerably full notes of nine cases of asthma in which lobeline, in doses varying from ¾ of a grain to 6 grains, seemed to produce decided relief from the asthmatic symptoms, and he terminates his memoir with the following conclusions: 1. Lobeline does not possess the toxic effects generally attributed to it in the doses which he recommends. 2. It possesses no emetic or nauseating properties, as is the case with lobelia, and its employment is, therefore, preferable where lobelia is indicated. 3. He has employed it in doses of from ¾ of a grain to 6 grains daily for adults; for children, 1/6 to ¾ of a grain. 4. It has no i

tating action on the cellular tissue, and therefore may be administered in hypodermic injection,—a fact which renders it more preferable than the tincture of lobelia. 5. The evident action of lobeline on the nervous system would seem to indicate its employment in other convulsive affections, such as tetanus. 6. The cases in which he has employed lobeline have remained permanently cured.

A NEW DIAGNOSTIC SIGN FOR THE DIFFERENTIAL DIAGNOSIS OF GASTRIC CANCER AND ULCER OF THE STOMACH.

THE differential diagnosis between cancer and ulcer of the stomach is frequently obscured by the greatest difficulties. There is no pathognomonic sign which in any given case can positively establish the existence of the one or the other affection. In deciding as to the presence of cancer, the diagnosis is generally determined by the advanced age of the patient, the localization of the pain in the epigastrium, the interval elapsing between the ingestion of food and vomiting, the black coloration of the hæmatemesis, the gastric dilatation, the presence of the tumor or induration in the region of the epigastrium, the yellowish cachexia, the production of white, painful œdema, the rapid progress of the disease. On the other hand, in gastric ulcer the patients have not usually reached middle age; there is radiation of pain to vertebral column; vomiting follows almost immediately on the ingestion of food; vomited blood is brilliant red in hue; while dilatation of the stomach, epigastric induration, and especially cachexia, may be absent; and, finally, the progress of the disease is variable, and frequently remissions occur in the course of its evolution. Unfortunately, there are, however, numerous cases in which part of these signs are absent, or even in which both classes of symptoms may occur in the same patient. Numerous attempts have been made to determine some positive diagnostic sign. Thus, in 1886, Troisier noted the implication of the subclavicular ganglia in cases of cancer, and insisted upon the diagnostic importance of this symptom.

In 1887, Hayem called attention to the great excess over normal of the white blood-corpuscles of the blood in cases of cancer, while recently great stress has been laid upon the character of the acid in the gastric juice, it being claimed that in cancer of the stomach hydrochloric acid is no longer secreted, and is thus absent from the gastric juice. Nevertheless, all these special signs have met with contradiction.

A point proposed some time ago by Professor Rommelaere, of Brussels, and since emphasized by numerous others, consists in the observation that in malignant tumors, whatever may be their locality or morphological aspect, the amount of urea excreted in the urine gradually decreases, until, finally, it is not more than one hundred and eighty grains in twenty-four hours.

In a paper published in the *Gazette Hebdomadaire de Médecine et de Chirurgie*, May 10, 1889, Dr. Rauzier adopts this view, and he reports a case which presented the clinical picture of gastric cancer in which the diagnosis of gastric ulcer was based upon the continued presence of the normal amount of urea in the urine. This diagnosis was confirmed by the post-mortem examination. Dr. Rauzier concludes that, in cases where the clinical symptoms are insufficient to establish the differential diagnosis between cancer and ulcer of the stomach, without ignoring other methods of examination, such as the examination of the subclavicular glands, enumeration of the white blood-corpuscles, and the search for hydrochloric acid in the gastric juice, the estimation of the daily amount of urea excreted would give important assistance in making the diagnosis.

Of course the reduction of the excretion of urea is simply one form of expression of the depressed nutritive state of subjects suffering from cancer, in which there is faulty assimilation of nitrogenous food-principles, so that while increasing the albuminous ration must increase the amount of urea, less would be excreted by a cancerous subject than by a healthy individual on the same diet. We cannot believe that this sign of cancer would be of very early occurrence in this disease; it could not appear until the tissues have been largely depleted of their store of proteids, and until digestion and assimilation had been seriously disturbed. At first sight we are not disposed to admit that this sign would be absent in all cases of gastric ulcer, for, if the cause given be the correct one, it is inconceivable that it should not also be present in certain cases of advanced gastric ulcer. Further estimations of the amount of urea excreted in different wasting diseases are needed before this diagnostic point can have the value attributed to it by Dr. Rauzier.

Reports on Therapeutic Progress.

THE SURGERY OF THE GALL-BLADDER.

At the meeting of the Eighteenth Surgical Congress, held in Berlin, June 1, HERR CREDÉ (Dresden) took this subject for an address. His observations were based on five cases. All had suffered from gall-stone colic for more than eight years, and all were reduced in flesh. In one case no tumor could be felt, but in the others the swelling was evident. The tumor was of great diagnostic value. If the gall-bladder felt soft, it must be more or less normal; it could fill up, as it was not attached to the neighboring parts, and a normal condition might be restored by cystotomy. In other cases, in which distention could not take place, there was degeneration, and there was no chance of restoring the functions of the viscus. In such cases extirpation was demanded. In one case in which he could see only the point of the gall-bladder like the tip of a finger, he raised the liver, separated the gall-bladder with great difficulty, opened it, and removed two large stones. On examining with the finger, he felt the end quite rounded; he could not penetrate into the ductus communis. As he was about to remove the gall-bladder he felt another rather large stone deep down, which was plainly the cause of the severe symptoms. He removed the stone and then excised the gall-bladder. Four arteries spouted, which were compressed with forceps and removed after twenty-four hours. On account of the firm attachment of the liver to the gall-bladder it was thoroughly cauterized. No reaction; no fever. Later, some calculi came away, and always in connection with an attack of colic. In the second case four large stones were removed, and the gall-bladder was then drained. When the gall-bladder was removed from dogs, they immediately got enormous appetites; but notwithstanding a plentiful supply of food, they emaciated considerably. In the two cases mentioned quite a fabulous appetite declared itself shortly after the operations, and the first patient soon lost twelve pounds in weight, and the second five. They did not show any increased weight till the sixth week. He thought that notwithstanding the results hitherto had been unfavorable, they would be much better when the method of operating had become perfected.

HERR THIEM (Kottbus) had a patient sent to him with an abdominal tumor. In injecting the rectum with water, the ascending colon could be plainly felt, and he concluded the tumor was a malignant one of the omentum.

Operation.—As it was impossible to separate the tumor from the abdominal wall, this was cut straight through with the scissors. He then followed a band upward and reached a second tumor,—the gall-bladder. This was intimately adherent to the intestine and omentum. Severe parenchymatous bleeding. After its arrest and ligature of the cystic duct the tumor, which was hour-glass shaped, was removed. Not only the gall-bladder, but its connecting passage and the tumor of the abdominal wall were distended with gall-stones. A gall-stone fistula soon formed, and healing never took place.

HERR KÖRTE demonstrated some gall-stones, one of which he removed from the interior of the small intestine, which had become blocked up by it. The patient died twelve hours after the operation.

HERR REHN (Frankfort) had also removed a biliary calculus that gave rise to symptoms of ileus. The patient recovered.

HERR HAGEMANN had performed three operations of the kind under discussion, two cholecystotomies, and one cholectomy. All the cases recovered. The subsequent history of the cases was as follows: The first patient lived a year, then became cachectic, and died. The second became ill three months after operation, with pains and shiverings. Examination revealed echinococcus cysts in the stools, evidently from the liver. An exploratory incision was made November, 1888. Three days later she became somnolent, and died of septicæmia. Section showed a rather large collection of echinococci that had burst in the direction of the surface. The third patient was living, and three weeks before had a slight attack of colic.

HERR HELFERICH (Greifswald) had had a fatal case in which a gall-stone gave rise to symptoms of ileus. The half of a gall-stone was found at the point of entry of the gall-bladder into the duodenum. It had here destroyed the muscular tissue, and in consequence of this had set up circumscribed peritonitis, dragging in its train the ileus, and paralysis of intestine.

HERR TISCHENDORF (Leipsic) had extirpated the gall-bladder two years ago. The patient was still quite well, and was then half way through a normal pregnancy.

HERR LANGENBUCH (Berlin) had had a total of twenty-four extirpations of the gall-bladder. The more experience he had, the more he felt the need of collecting furth

information and of hearing the observations of his colleagues. It was very difficult to formulate any guiding principles for the choice of the method of operation. Cholecystotomy was an operation that well deserved recognition, although its results were not so favorable as had been represented. Out of seventy-five cases of operation there had been two relapses, eleven deaths, and sixteen cases of fistula; in 61.3 per cent. uninterrupted recovery. He had only lost two out of twenty-two cases, through too late operation. In cases in which he felt the ductus choledochus filled with calculi he would not operate at all, or with the greatest caution.—*Medical Press and Circular*, June 5, 1889.

A NEW TREATMENT OF THE TRANSVERSE FRACTURE OF THE PATELLA.

At the meeting of the Clinical Society of London, held May 24, 1889, MR. MAYO ROBSON related a case of transverse fracture, which he treated by a new method to secure bony union without opening the joint (*Lancet*, June 1, 1889). The bone was broken just below the middle, as the indirect effect of a fall. He pointed out how unsatisfactory were the results obtained by the methods usually resorted to, and added that although he had never met with an accident in wiring the fragments, yet it was impossible to shut one's eyes to the fact that the patient was exposed to a great risk. He had, therefore, applied himself to the discovery of a method whereby the advantages of bony union might be secured without incurring the risk of opening the joint. In this case the skin over and around the joint was cleaned and rendered aseptic, and the joint was then aspirated. He then obtained two long steel pins with glass heads, such as ladies use for fastening the bonnet, and having thoroughly purified them, he drew the skin well up over the upper fragment, and introduced the needle transverely through the skin and muscle just above the level of the upper fragment, repeating the operation with the other needle at the upper end of the ligamentum patellæ. Gentle traction on the pins then easily brought the fragments into apposition. The ends of the pins were then clipped off, leaving about half an inch on either side, and the whole covered with antiseptic gauze. This dressing was left undisturbed for three weeks, and when it was removed there was no redness or other sign of irritation having been caused. The temperature was never above normal, and the patient felt very comfortable all the time. The fragments seemed well united, and the needles were, therefore, withdrawn, a plaster-of-Paris splint applied, and the patient allowed to go home. We pointed out that the only precaution necessary was to draw up the skin over the upper fragment, in order to avoid undue traction upon it when the fragments were approximated. The integument should be rendered aseptic as well as the pins, and the latter should be stout enough not to bend when drawn upon. If there was much effusion, it would be desirable to aspirate. As union occurred without the throwing out of any amount of provisional callus, it was always well to insist upon the use of a Thomas's splint for some time after. The advantages of the operation were its simplicity, the absence of risk, and the obtaining bony union. He said that this was the second case of the kind upon which he had operated, and more recently he had performed the same operation in a case of fracture of the olecranon, but it was as yet too early to say anything as to the result.

MR. HEATH had examined the case, and thought the union was bony; if it were fibrous union, the distance between the fragments was so short that bony matter would soon develop between them.

MR. GODLEE thought the procedure a very simple one. He asked how the torn fibrous expansion of the quadriceps aponeurosis was prevented from becoming tucked between the ends of the broken bone.

MR. SYMONDS asked whether in the first case operated on good bony union had been obtained. It would be interesting to know what would be the condition of the joint three months later. Mr. Lund had passed pins through the bone itself, but he found this difficult to do when the fracture was near the lower end of the bone.

MR. R. W. PARKER wondered whether there was any real advantage in getting bony union. He related the history of a case where a patient, rather than submit to the tedious waiting necessary to secure bony union of a second fractured patella, refused to come into hospital, and was treated as an out-patient; a widely separated fibrous union resulted, with which the patient was quite contented, being able to walk easily and to earn her living.

MR. WARRINGTON HAWARD doubted if the union were bony; but, even if not, it was certainly very firm and useful. A medical friend

of his sustained a fracture of the patella, and ligamentous union resulted, there being three-quarters of an inch separation; but, notwithstanding this, absolutely no inconvenience followed, and the limb was thoroughly serviceable in every way.

MR. HEATH said that it was a great thing to avoid tampering with the joint. Few medical men had such confidence in antiseptics as to have their own knee-joints opened and the fragments wired. His own treatment was to aspirate the joint and to put the limb up in plaster of Paris.

MR. ROBSON, in reply, said that one great advantage of the method was that it was practically unattended with danger. In both cases he aspirated the joint, passed a needle between the fragments, and lifted up any aponeurosis that might be in the way. He had met with a case in a sailor with a fibrous union, who was unable to do his work, though he was quite restored after the fragments had been wired. In the first case he had operated on, the splint had been removed too early, and the result was that the union had given way, and there was little separation between the fragments.

THE TREATMENT OF URETHRAL STRICTURE.

At the third annual meeting of the American Association of Genito-Urinary Surgeons, held at Newport, May 21 and 22, 1889, DR. A. W. STEIN, of New York, read a paper entitled "Aphorisms on the Treament of Urethral Stricture," in which he especially dwelt upon the necessity of determining the patient's state of health before operating, and especially in regard to the manner in which the kidney fulfilled its function (*New York Medical Journal*, June 8, 1889). It was also extremely important to decide whether the obstruction was a greater evil than the proposed remedy. The first proposition he offered was that gradual dilatation was unquestionably the safest way to treat urethral stricture. With this method it was unusual to observe rigors and urethral fever operating. One objection to the method was that patients coming from a great distance often demanded a rapid cure, but the patient's life should not be jeopardized to save time. Thirdly, a urethra would support incision better, when this was necessary, if it had previously become accustomed to the passage of the dilating instruments. Fourthly, the nearer the coarctations were to the meatus, the more unyielding and resilient were they, and they were only amenable to dilating urethrotomy. It was rare that rigors and fever followed incisions near the meatus. Fifthly, the danger of internal urethrotomy increased with the distance of the stricture from the meatus. On the other hand, the nearer the stricture was to the bulbous portion of the urethra, the more dilatable it was. Dilatation should, therefore, be first thoroughly tried. Sixthly, an external incision should be made preferably to an internal incision, in strictures requiring incision, when accessible through the perinæum. Anterior strictures divided internally were rarely accompanied by unfavorable symptoms when the urine was made to escape by a perineal orifice. Eighthly, divulsion was unnecessary in the bulbous portion of the urethra, and was always dangerous, rude, and purely mechanical, requiring no surgical skill. Ninthly, the replacement of the term urethral fever by that of urinary fever was not a happy one. Urethral fever could often be proved to be a vaso-motor disturbance of reflex origin and not due to absorption of urine through a solution of continuity of the mucous membrane. Tenthly, in its results, thorough dilatation compared favorably with urethrotomy. An absolutely radical disappearance of a narrow stricture was of the rarest occurrence. In strictures of large calibre the results were more favorable by whichever method they were treated.

DR. WATSON, of Boston, related a case of stricture which had been operated upon by Dr. Cheever, who performed external urethrotomy. It was a tough fibrous stricture, extending from the bulbous portion of the urethra to the middle of the membranous portion. The stricture was incised and dilating instruments were used afterwards, the last one used being a No. 29. During nine years the case was not treated in any way, and at the expiration of that time a No. 27 was easily passed, showing that the cure remained permanent. The speaker recommended external urethrotomy and the making of one clean incision on the floor of the urethra, and perhaps one on the roof of the canal.

DR. POST, of Boston, said that many strictures of the deep urethra were not radically cured by an operation. It seemed rational that they should best be cured by external urethrotomy. If many were cured by internal urethrotomy, more still ought to be cured by the external operation, in which the sense of sight aided the sense of touch. The prob

ability of cure must depend upon the care with which the operation was done. The threads used for sutures, if badly inserted, might cut and enlarge their passages, and contusions of the urethra might be made by bungling assistants with forceps, etc.' After external urethrotomy the patients would mostly pass their urine by the normal urethra at the end of a week. The speaker then showed several charts upon which the temperature of patients having undergone external urethrotomy was traced. In most of them no rise of temperature was indicated. One patient with considerable fever after the operation experienced a fall of temperature to the normal when a urethral sound was passed, thus showing that it was not dangerous to pass a sound during urethral fever.

Dr. Arthur T. Cabot, of Boston, had seen two urethræ five weeks after the operation of divulsion had been done upon them. In one case the patient died three weeks after the operation, of Addison's disease. In both cases the strictures were pretty tight. After divulsion the sound, No. 30, passed easily, showing that the tissues were really broken. It seemed to him that divulsion was specially applicable to these soft strictures of the deep urethra, but that it was an improper operation in fibrous and inodular strictures.

The President highly recommended gradual dilatation as a means of cure. He said that any mode of treatment that added to the patient's comfort might still be used. He had seen the introduction into practice of the methods by dilating urethrotomy and by divulsion. After Dr. Otis's method of internal urethrotomy had become known, it was shortly so popular that a urethrotome might be seen sticking out of every hospital student's pocket. He thought that in the majority of cases soft stricture might be cured by gradual dilatation, if the patient and the doctor took time enough about it. It was to be regretted that the love of cutting had made the method of gradual dilatation fall into bad repute. The excellent results of gradual dilatation were shown by the report of a case that he had first seen in 1870 or 1871. The stricture had its origin in a mistake made by another practitioner, who had injected nitric acid into the patient's urethra instead of the solution he intended to use. When the speaker saw him there was a sausage-like mass of tissue, as hard as india-rubber, situated between the urethra and the rectum. It was a fibrous carctation around the urethra, and only a No. 4 or a No. 5 bougie would pass. The opening was gradually enlarged to admit a No. 20 (English) *bougie à boule*, but it required two or three years to accomplish this. The patient, who was a boy, had continued to develop, and a No. 34 could now be passed into the bladder. He had not been laid up a day since the cure was effected, over seventeen years ago. Sometimes the speaker was not satisfied with the slowness of gradual dilatation. He would then make a superficial incision of the stricture with a small urethrotome and afterwards use a dilator. That method of procedure gave him much satisfaction.

Dr. Watson thought that the president had underestimated the value in which gradual dilatation was held by genito-urinary surgeons generally. As for himself, he employed dilatation ten times where he employed urethrotomy once.

Dr. Keyes did not think that Harrison's explanation of the formation of fibrous or inodular tissue was the only correct one. He thought that, over and above the chemical element in the formation of a stricture, there was also an irritative element. In follicular abscess of the urethra the urine was in contact with the seat of inflammation, yet often no inodular tissue was formed. He would not absolutely condemn divulsion; he thought that it was still defensible in certain cases of soft stricture. In one instance, while performing urethrotomy, he had incised the stricture so thoroughly that the only tissue left uncut was the skin of the penis. The patient disobeyed orders and passed his urine without the use of the catheter, producing thereby an infiltration of urine which was cured without suppuration by multiple incisions. Surgery had made so little progress in the treatment of deep urethral strictures that it was to be hoped that the procedure of cutting out the inodular tissue and replacing it by three-fourths of an inch of somebody else's mucous membrane would be successful. Sometimes much difficulty was experienced in passing an instrument after external urethrotomy. In one case which the speaker had seen operated upon, the perineum was incised and a large sound was passed through the urethra to the bladder, but afterwards no instrument whatever could be passed, and a fistula formed at the seat of operation. This operation had to be repeated in three or four weeks, when the perineal fistula closed. It was then found that the obstacle to the passage of a sound

consisted in a fold or mucous structure upon the roof of the canal, and his custom now was never to open the urethra without feeling along the roof to see that no such fold or structure existed; if one was found, it was incised.

DR. BRYSON reported a case showing the effects of urethrotomy and of divulsion on the same urethra, which was the seat of two strictures. The first stricture was situated at the distance of two inches and a half from the meatus; the second, which would admit a No. 12 French, was in the bulbous portion of the urethra. The first was cut with an Otis's urethrotome, with anæsthesia: the other one was divulsed. After two years the patient came back, when it was found that the first stricture had remained cured, while the second had recontracted. For two months the patient had been passing his urine through fistulæ, one of which opened near the umbilicus. This did not give escape to the urine in a periodical or regular manner, as the normal urethra would, but, on the contrary, the urine flowed from it whenever there was any to flow. The diaphragm-like stricture on the roof and floor of the canal was divided, but the patient died subsequently from nephritic complications. As to the question, Did dilatation ever radically cure deep urethral stricture? he believed it did, and that there were cases in which not only was the stricture got rid of, but the mucous membrane was so modified that the cure was radical. If the speaker cut a stricture, it was done invariably with the intention of dilating it afterwards. In regard to the question, Did electrolysis ever cure deep urethral stricture? he said that the electrolytic action might stimulate the parts to aid dilatation. Did perineal urethrotomy ever cure stricture? It certainly did, as Dr. Keyes's cases showed. He believed that the excision of cicatricial tissue should be resorted to, and that the idea of urine-leakage as the origin of stricture led also to that conclusion.

PHYSIOLOGICAL ACTION OF ANTIPYRIN.

In the *British Medical Journal* for June 1, 1889, DRS. BATTEN and BOKENHAM publish an experimental essay from the laboratory of Dr. Lauder Brunton, as to the physiological action of antipyrin. They summarize their conclusions as follows: The main action of antipyrin, if not its sole action, is due directly or indirectly to its influence on the nervous system. It appears to act on all parts of it, mainly on the spinal cord, but also on the brain and motor nerves. They have not yet succeeded in localizing the tracts of the spinal cord, which are especially affected by antipyrin, but if it is fair to compare the symptoms produced by the drug with those the result of disease, then it would seem that the localization of the action of antipyrin is fairly obvious. The symptoms in question bear a very strong resemblance to those of lateral sclerosis, and the authors, therefore, think that the action of the drug may be localized in the lateral columns of the cord. For instance, in guinea-pigs and a cat, they found spastic rigidity of the hind limbs, and in all animals experimented upon rigidity formed a marked symptom. Further, in the first-mentioned animals, this symptom appeared to come on with any attempt to use the limbs, just as is the case with a patient with lateral sclerosis.

The excess of myotatic irritability is also very marked, the slightest tap being sufficient to evoke violent muscular contractions, and, in extreme cases, to cause clonic spasms of the whole body. In one experiment phenomena exactly similar to those of ankle clonus were obtained.

In all cases the contrast between the effect of painful stimuli and stimuli such as the slightest taps, or even the vibrations produced by walking about the room, was most marked, the former producing less effect than in a normal animal, while the latter caused the violent spasmodic movements already mentioned.

The localization of the action of drugs on the different tracts of the spinal cord appears to be a field of research in which, as yet, little has been done, and is one that gives promise of very interesting and useful results. In the present instance, the effects of the drug (antipyrin) are so transient, seldom extending over more than a few hours, and the recovery is so complete, that pathological results demonstrable by the microscope could hardly be expected. It is rendered more difficult from the fact that doses sufficient to cause death produce other symptoms not referable to the lateral columns alone.

Up to the present, the only instances in which definite changes have been found are the results of Von Tschisch, who, by using certain drugs, was able to show vacuolation of the cells of certain tracts of the nervous system. It is true that in cases of ergotism caused by the continual consumption of r bread containing ergot, there has been c

served sclerosis of the postero-lateral columns, with corresponding symptoms during life; but to what extent this can be attributed to the action of the drug alone is uncertain, as other influences (famine, etc.) were at the same time at work, and similar results have not been obtained by the prolonged administration of the pure drug.

With the haloid derivatives of the benzene group, Brunton and Cash have observed symptoms showing the brain and spinal cord to be affected, and "giving rise to general tremors on movement resembling that observed in disseminated sclerosis." Sometimes, too, the tremor was observed independently of movement. The same two observers also found that amido-benzene caused symptoms like locomotor ataxy in frogs. They made many attempts to produce the changes permanently, but the symptoms passed off after elimination of the drug.

Such is the present position of the subject. The importance of being able to localize the action of a drug to a special tract of tissue cannot be overestimated, and if further work should prove this to be possible it will go far to render the use of drugs in diseases of the nervous system a more rational proceeding.

As regards the action of antipyrin on the brain of mammals, but little can be said at present. From the rapid rhythmic movements noticed in many cases, and from the circus-movements sometimes observed, it may be concluded either that the motor centres themselves are involved, or that their inhibitory power is abolished.

THE SURGICAL TREATMENT OF RETROVERSION OF THE UTERUS WITH ADHESIONS.

At the meeting of the New York Academy of Medicine, held February 28, 1889, Dr. Wylie read a paper thus entitled (*New York Medical Journal*, May 25, 1889). He described a new method of shortening the round ligaments, and showed its applicability to a class of cases which had until lately been very troublesome to deal with,—where the uterus was held retroflexed by adhesions, but where the tubes and ovaries were not diseased. He believed, as he had maintained for many years, that displacements of the uterus were not of themselves necessarily the cause of disorder or pain. However, a diseased uterus was often put into a worse condition by displacements, especially flexion. Adhesions of themselves were not a disease, but an effort towards repair or shutting off diseased parts from the general cavity. They only became harmful when attached to diseased organs in a way which interfered with their circulation, or when they hampered other organs, such as the bowels, in their functional activities. Adhesions could be softened and stretched enough to release the intestines and relieve the endometritis commonly present in this class of cases; but since in nine-tenths of all cases of retroversion with adhesions there was also pyosalpinx, laparotomy was usually called for before the patient could be cured. Any one who had opened the abdomen often enough to be familiar with the conditions constantly met with when adhesions had formed in any amount, would appreciate how much greater the probabilities of rational treatment were after the abdomen had been laid open. It was now not a more dangerous procedure than stretching out adhesions, when we took into account the liability to causing a fresh inflammation in tubes and ovaries already diseased which was present in the great majority of these cases. Forcibly breaking up adhesions without opening the abdomen was never to be resorted to. He would keep the patient quiet as long as the symptoms were acute and there was any rise of temperature. But otherwise, whenever a retroflexed uterus was found to be enlarged and sensitive, he would put the patient in the prone posture and push up the uterus slightly with the finger. If the adhesions were attached to the fundus, the fixation of the uterus would be much greater than if the adhesions were in the broad ligaments. Adhesions in the latter situation caused most of the displacements of the uterus. In mild cases he would begin treatment by packing in pledgets of boro-glyceride cotton to restore the uterus to its position by securing drainage, dilating the cervix, and curetting the endometrium, according as the case seemed to demand; but if these failed, he would then make an incision and find out what he had to deal with. If with the patient under the influence of ether he found the uterus freely movable and the tubes healthy, he considered Alexander's operation not unlikely to do good, but such cases were not the majority of those that were met with. By stretching the adhesions the position of the uterus could not really be restored, since the adhesions were in no case broken up, and would in time return to their former state of tension. When ordinary treatment failed to relieve, and where the symptoms were such as to demand measures for relief, he pro-

ceeded at once to perform laparotomy, look over the contents of the pelvic cavity, break up all adhesions, bring the uterus forward and shorten the round ligaments so as to retain it upright, and remove diseased tubes and ovaries, if necessary, as was so often the case. At one time he had shortened the round ligaments by cutting out a portion of their length and reuniting their ends inside the abdomen; but a far better device, which he now used exclusively, was to scrape a suitable length of the ligament raw and then fold it on itself at this point and tie it together. Healing took place rapidly and firmly after this procedure, and the ligament was of course permanently shortened. A large Albert Smith pessary was then used to keep the uterus in its new position while healing went on.

Dr. B. F. Baer, of Philadelphia, present by invitation, was not prepared to agree with Dr. Wylie as to the pathology of displacements, and still held to the belief that displacements of the uterus had some share in bringing about its diseases; still his belief was not so strong as it had been, and he might in the future abandon it entirely. And still no one would suppose an organ in its normal position which was upside-down. All would agree that our present approved therapeutical measures were such as tended to restore the displaced uterus to its position, and even Dr. Wylie employed these. He believed with him most emphatically that it was a matter of the greatest importance to restore to mobility and upright position a uterus fixed by adhesions in retroflexion. Still he thought that in a large number of cases this could be done through the vagina by ordinary methods, including the use of the pessary. The interference with circulation and the pressure on nerve ends must be a part of the condition needing relief in uterine displacements, being directly due to that displacement. He entirely concurred with the reader as to the advantages of the new operation, and believed it a scientific and effective method. He could go further than Dr. Wylie in his estimate of its value, since he regarded retroflexion and displacement as causes of disease. He believed laparotomy justified in many cases for the sole purpose of shortening the ligaments. He had found the round ligaments very hard to find externally sometimes. He had lately operated in a case of retroflexion in which there were no adhesions, but in which all ordinary treatment (including the use of a pessary) had not availed to relieve the malposition. The tubes and ovaries were healthy. After opening the abdomen he had brought the uterus forward, but not without difficulty. In one-tenth of the cases the shortening of the round ligaments after a laparotomy would of itself be found useful. In nine-tenths there were likely to be diseased tubes and ovaries, besides adhesions. In either case laparotomy was justifiable. The danger of hernia was less than after Alexander's operation, and, as none of the patients operated on had as yet died, it seemed to be quite as safe an operation.

Dr. Mundé had not tried Dr. Wylie's method. All who had treated retroflexion with adhesions had felt that laparotomy might in some cases be required to effect a cure. However, systematic and prolonged tamponing had undoubtedly cured some patients. He had thought that the amount of adhesion produced by Dr. Wylie's method would hardly be sufficient to stand the dragging on the ligament, but he might be mistaken on that point. He had performed Alexander's operation twenty-six times, and believed that it fulfilled its object in suitable cases. The objection to it was not that the round ligaments could not in most instances be found, but that they could not always be drawn out, or were too thin to be of service. It was not to be compared to hysterorrhaphy, since absolute mobility of the uterus was an indispensable condition for its performance. Recently he had had a case of complete prolapse of the uterus, and had decided to attempt a cure by shortening the round ligaments. He had accordingly found and exposed the ligament on one side, and had then made careful traction on it, remembering that it might be weak. The rupture of a large vein and a troublesome hemorrhage had first occurred. When he continued to pull on the ligament, it broke off short. He therefore did not attempt the procedure on the other side, but at once performed laparotomy and stitched the fundus of the uterus to the anterior abdominal wall. So far the result had been excellent. The cases in which hysterorrhaphy was indicated were those in which the adhesions were capable of being stretched, and the uterus could be lifted up into position by the finger pushing upon it through the posterior vaginal wall, or by an ordinary repositor, but returned to retroflexion as soon as these were withdrawn. Where the adhesions were very dense it might be impossible to liberate the uterus, ovaries, and tubes without a risk of tearing and injuring the latter. This had happened to hi in one case, and he had been obliged to giv

up the attempt. The patient fortunately had recovered. A possible danger from hysterorrhaphy seemed to him to be the slipping and incarceration of intestines between the uterus and bladder. In the two successful operations which he had performed, he had found the constant protrusion of the intestines during the operation to be a source of great annoyance, especially by their interfering with the introduction of the sutures through the broad ligaments and fundus. He thought it might be well to stitch the uterus up first and tie the sutures before inserting the other sutures in the abdominal wall. Many cases of backward displacement could be cured by tampons and pessaries. Hence the operation of hysterorrhaphy had a limited field of usefulness and applicability, and certainly was not devoid of danger. With regard to the significance of forward displacements, he believed that, although they were not of themselves the cause of uterine symptoms, they might yet in course of time produce symptoms indirectly by favoring engorgement. Then, too, the peritoneal surfaces brought into contact might become adherent. He therefore thought that even such displacements should be treated and cured if possible.

Dr. G. T. Harrison thought that retroflexion complicated by perimetric adhesions was emphatically a pathological state, and either by the specialist or the general practitioner must always be considered as one requiring relief. He must dissent from Dr. Wylie's opinion that backward displacement was in itself a matter of small concern. On the contrary, he thought that treatment was needed in every case in which it occurred before the woman could be well. He believed that a really normal position could not be obtained in these cases by shortening the round ligaments. The uterus naturally was freely movable, but the shortening of the round ligaments tended to produce anteflexion in place of retroflexion; it did not therefore restore normal position. One great objection to ventral fixation was its holding the uterus forward so as to interfere with the normal excursions of that organ. It made an exchange of one evil for another. However, Dr. Mundé had admitted that the operation was a recent one, and was still on trial. The speaker had no doubt that many of the women operated on in this way would afterwards have trouble with the bladder, and also during the progress of pregnancy and in delivery. It was certainly important that during the puerperal period the parturient woman should not suffer from over-distention of the bladder. It was a matter for congratulation that we had a means of dealing with almost all cases of retroflexion complicated with perimetric adhesions,—namely, massage applied by a modification of Brandt's method. The speaker had employed massage with excellent results without having read or being minutely acquainted with Brandt's directions. He could testify that pessaries did often cure retroflexion, although a whole year or five years might be required to get this result. He believed that it was the relaxation of the uterosacral ligaments which was the active and important element in the situation when the uterus was displaced backward, and, as Alexander's operation did not take this into account, he thought it lacking in real applicability to these cases.

Dr. A. F. Currier had seen Dr. Wylie do his operation and was familiar with his ideas in regard to it. As Dr. Mundé had said, no surgeons except Dr. Wylie and Dr. Baer had done the operation, and discussion of it by others could not be carried very far. The main question before the meeting related to the treatment of backward displacement of the uterus by any and all methods. The advantages of Dr. Wylie's operation, or its disadvantages, could not be directly discussed so soon as this after its introduction. We were bound to consider what results really followed backward displacements. In some patients certainly there were no symptoms produced; in others there were very marked symptoms, the result of engorgement, which demanded treatment. In a third class of cases, though there were symptoms of a certain sort, the chief result of the displacement was a general atrophic change in the uterine tissue, and this was incurable. Cures were undoubtedly effected by Alexander's operation, by Dr. Wylie's also, and by pessaries as well, and particularly in unmarried women. Another point but briefly alluded to by Dr. Wylie was the method of forcible replacement of the uterus when it was retroflexed and held by dense inelastic adhesions and shortenings of its ligaments. Retroflexion caused the layers of the broad ligament to become folded on each other, and if then an inflammatory process was set up, these folds would very soon adhere to each other. A question then arose as to what method could be used to break up these adhesions safely, so that their shortening and the resulting traction on the uterus might be brought to an end. It could certainly not

be done by the method called Schultze's operation, which he had employed, but without success. Whenever, with the hand on the abdomen, a sound in the uterus, and one finger in the rectum, he found that the layers of the broad ligament were adherent to each other, and that when the uterus had been restored to position by the sound it immediately sprang back as soon as the sound was withdrawn, he knew that forcible replacement must be a main procedure. As to the value of pessaries in uterine displacements, he believed with Dr. Harrison that they cured some cases. He had sometimes followed a case for two years after pessaries had been successfully used to replace a uterus, during which time, as the uterus retained its new position steadily, he had simply gradually reduced the size of the pessary until he was convinced that none whatever was needed. He thought that none but experienced and skilful operators should attempt so bloody an operation as the method by laparotomy might prove to be. He agreed with Dr. Mundé that in case of retroflexion with a perfectly movable uterus Alexander's operation was a good and useful one, but that if the uterus was adherent, either hysterorrhaphy or Dr. Wylie's new method was called for.

The CHAIRMAN remarked that it was recognized by all that some cases could not be cured by Alexander's operation, by pessaries, or by tampons. Moreover, Alexander's operation had been as fatal as laparotomy in the hands of the best operators, but not more than was to be expected. He did not think that the Alexander operation was backed by good surgical principles, and believed that, if pessaries failed to effect a cure or a long relief from symptoms, we should open the abdomen at once, and so make sure at least of what there was there needing treatment. At the same time, when pessaries gave relief for one or two years, that relief was for the time a cure. The reappearance of the disease in time did not prevent that. Pessaries did certainly often do this much. However, plenty of cases occurred where the adhesions needed to be broken up. As to hysterorrhaphy and the opinion that its result was incompatible with the uterus lying in its normal relations, and that it left a pathological condition present which would interfere with a normal pregnancy, he would say that he delivered a woman upon whom this operation had been done of a full-grown child, and had observed no symptoms of there being anything wrong.

DR. WYLIE professed himself ready to try other operations whenever a valuable addition to our resources should seem to have been made. He had only put forward his present method as one which would replace hysterorrhaphy to advantage in the same sort of cases. It did not cure uterine diseases, but it removed one of the complicating elements which interfered with the likelihood of a full recovery of health. Thus, we could treat chronic endometritis to better advantage after replacement of a retroverted uterus. As to treating this condition of perimetric adhesions by massage, he would say that he valued the method as preparatory to other treatment in uterine diseases, but in many cases it would prove insufficient. The treatment by pledgets soaked in boro-glyceride was to be tried, also dilatation of the cervix and drainage, also pessaries and massage. He refused to operate until this had been done faithfully; but, when all these had failed, the operative procedure became in order. When the broad ligament had folded on itself and become adherent in the way described by Dr. Currier, salpingitis was usually present, as laparotomies were constantly showing. Here, too, when general treatment had failed, laparotomy gave an opportunity to remove the diseased appendages, besides breaking up adhesions and allowing the uterus to regain mobility, which he regarded as of more importance than position. Atrophic conditions he did not expect to cure. He only brought the uterus far enough forward to bring it about that, in making exertions or in efforts at stool, pressure should come upon the top of the uterus and not upon its anterior side.

THE INFLUENCE OF THE PHOSPHATE OF SODIUM ON THE EXCRETION OF URIC ACID.

DR. A. HAIG read a paper with this title before the Royal Medical and Chirurgical Society at the meeting, which was held Tuesday, May 28, 1889 (*British Medical Journal*, June 1, 1889). He said that pure phosphate of sodium had long been known to be a solvent of uric acid, and he had pointed out that it increased the excretion of that substance. But all specimens of sodii phosphas (British Pharmacopœia) did not act equally well, and some caused little or no plus excretion of uric acid, and might even cause joint pains or precipitate an attack of gout. Results of analysis of several specimens of the salt were given, showing that it was gen-

erally mixed with a small percentage of sulphate of sodium. The excretion of uric acid under the pure phosphate (Na_2HPO_4) was shown, where there was a plus excretion of uric acid the whole time the salt was taken. This phosphate was made by the careful combination of sodium hydrate and phosphoric acid. The pure phosphate was then combined with fifteen per cent. of sulphate, and it was shown that this mixture did not cause plus excretion of uric acid, and the notes showed that it caused very marked pains in the joints, due probably to retention of uric acid in them. It was also mentioned that if a little dilute phosphoric acid was mixed with the pure phosphate in solution, it then did not cause plus excretion of uric acid; but if a little bicarbonate of sodium was mixed with it instead, the plus excretion was well marked. From these facts it was inferred that, while the pure phosphate of sodium (Na_2HPO_4) caused a plus excretion of uric acid, its action might be hindered or prevented by admixture with mineral acids or their salts outside the body, or by meeting with much acid in the intestines or elsewhere in the body. It was suggested that these acids or salts might take alkali from the phosphate Na_2HPO_4, and convert it more or less into the acid phosphate NaH_2PO_4, thus destroying its power of increasing the excretion of uric acid. And as some change of this kind might occur during crystallization, all specimens of the pure phosphate did not act equally well; but the addition of a little bicarbonate of sodium to each dose was generally sufficient to insure a satisfactory excretion of uric acid. The phosphate was not likely to be of use in acute gout, because the acidity in this disease was very high; but it had appeared to the writer to be of considerable value in the mental depression of uric acid in which the acidity was low and falling. Where the phosphate was sufficiently powerful it had some advantages over salicylate of sodium, with which its action was contrasted.

DIABETES.

According to the Paris correspondent of the *Lancet*, June 8, 1889, DR. WORMS introduced at the Academy of Medicine a discussion on that most important question,—the nature and treatment of diabetes. All the opinions and theories already known have been expressed at the tribune. According to Dr. Worms, diabetes is not a disease *per se*, but a symptom. He thinks that no exclusive theory whatever can explain the real nature of diabetes. "It is a personal resultant of hereditary pathological convergencies or of others infinitely complex." He had closely observed forty-one diabetic patients for a long series of years, and he noticed that thirst, polyuria, emaciation, and alteration of the teeth were often found wanting during the whole duration of the malady. Sugar was, of course, found in variable quantity, and that independently of all digression from the scale of diet or of any other appreciable cause. He therefore does not think it necessary to class diabetic subjects in distinct categories by only taking into account the average quantity of sugar found in the urine after a few analyses. As regards the treatment, it is all-important to maintain in the highest degree the vital energy and the integrity of the digestive functions. The diet he adopted was that prescribed by the late Professor Bouchardat, which has become classic; but in certain cases, when there is a diminution of the quantity of the urinary sugar, the scale of diet may be departed from, and even a little bread may be allowed. Dr. Worms does not approve of the employment of saccharin for sweetening certain aliments of diabetic subjects, as it appeared to cause disgust and to act injuriously on the digestive functions, which it is most important to protect. As regards drugs, he still gives the preference to the sulphate of quinine, which he prescribes in doses of from 20 to 30 centigrammes (3 to 4½ grs.), to be continued for a long time. In certain cases he found arsenic and opium useful. He thought that antipyrin was of too recent introduction in the therapeutics of diabetes to pronounce definitely on it. Bromide of potassium, which he also frequently employed, gave him only unsatisfactory results. Dr. Dujardin-Beaumetz combated some of the opinions expressed by Dr. Worms at the previous meeting of the Academy. According to him, and contrary to the views advanced by his colleague, thirst, polyuria, and an exaggerated appetite are phenomena which almost constantly accompany diabetes; it is not a symptom, as asserted by Dr. Worms, but a veritable malady, which affects the entire economy. As regards diet, he entirely proscribed milk, lactose being one of the sugars which most rapidly passes into the urine. He is in favor of boiled potatoes, and prefers the soja to the gluten bread. He advised his patients to eat all sorts of fatty substances, and, furthermore, saw no objection whatever to

adding saccharin to their tea or coffee in the proportion of 10 centigrammes to each cup, which would give them the delusion that it was sugar. In respect to drugs, one might employ with advantage arsenic, the salts of lithin, the sulphate of quinine, etc.—in fact, all substances which have an elective action on the spine and on the bulb. Finally, muscular exercise must not be forgotten. Thanks to these means, the diabetic subject might be placed in excellent condition to combat the causes of debility and of organic decay to which he is so frequently exposed. Professor Germain Sée, who followed in the debate, did not believe that the current theories which have been advanced to explain the appearance of diabetes are proof against criticism. M. Sée has established, by a series of experiments on patients in his ward, that their urine normally contained glucose, but in such a small quantity that it could not be revealed by the ordinary reagents. By the aid of a new reagent, however,—the phénylhydrazine,—M. Sée has been enabled to establish the presence of sugar in healthy urine even when there are only 33 milligrammes to 100 grammes of urine. In the normal condition, for the sugar to pass into the urine, one must ingest 250 grammes of cane sugar or 200 grammes of sugar of milk. In diabetic subjects, on the contrary, the smallest quantity of these sugars is found again in the urine, and augments the pre-existing pathological figure. In all cases the sugars ingested in large doses act at the same time as diuretics. Besides sugar, M. Sée has found in normal urine, by divers reagents, the chloride of benzole, naphthol *a*, furfurol, constant quantities of the hydrate of carbon similar to the group of dextrines and approaching the group of glucose. Their transformation in this last group is possible, and this would explain the establishment of glycosuria. The formation of glucose is also a normal phenomenon which results from the transformation of the glycogenic matter of the liver into grape sugar. This glycogenic matter is developed not only at the expense of the amylo-saccharin substances introduced with the aliments, but also at the expense of the albuminates proceeding from without or from within. If, therefore, sugar in the urine is normal, and if the glycogenic matter in the liver and in the muscles is normal, glycosuria will only be an exaggeration of the normal genesis. From normal glycosuria and diabetes there is but one step; the two states are derived from physiology, and are connected. This is why diabetes has no distinct species; it is one, always the same, and varies only by the conditions of its development in the rich and the poor, in adults and in children. The poor and children are affected with a diabetes of misery, the others of luxury. The origin of diabetes is in the circulation of the liver excited by the vasomotor system of this organ, which system is under the reflex influence of an irritation from the medulla oblongata and from nearly all the nervous centres. The hyperactivity of the liver leads to a neoformation of glycogenic matter or a rapid exaggerated transformation of this substance into sugar. In the treatment of diabetes, Professor Sée is in favor of the absolute exclusion of milk. He advises fatty aliments, the crumb of bread, tea, coffee, exercise, and, as regards drugs, opium and antipyrin. Dr. Robin declared that he agreed entirely with Professor Sée regarding the glycogeny and the azoturia in the physiological state.

THE ETIOLOGY OF FIBRINOUS PNEUMONIA.

At the meeting of the Medical Society of the County of New York, held March 25, 1889, Dr. August Seibert read a paper with this title, devoted to the evidences of an infectious element in the causation of ordinary pneumonia (*New York Medical Journal*, May 25, 1889). It was only within twenty years, and mainly within ten years, past that the invasion and growth of infectious material in the body had been looked to for an explanation of epidemic and endemic appearances of pneumonia, and of the occasional occurrence of purulent complications and of the form of pneumonia called migratory. The so-called one-day pneumonia, with the fall of temperature twenty-four hours after the initial chill, while dulness, bronchial respiration, and rusty sputa were observable several days longer, had been observed only since 1877, and had furnished further material for consideration and for doubt that a simple inflammation due to exposure to cold was all that was present in such cases. The statistics concerning the relative frequency of pneumonia among soldiers when in the field or in barracks, among sailors, among those who went on Arctic expeditions, and finally among the inmates of prisons, convents, and boarding-schools, had appeared all coinciding in showing that persons leading an outdoor life, exposed often to bad weather, were in far less danger of being attacked by pneumonia than those spending most of the

time indoors. These statistics had, in fact, shown that a liability to pneumonia increased in exact proportion to the time spent in closed rooms. Investigations had shown pneumonia to be most common among aged people and young children, and not young adults, as had always been supposed. In a certain epidemic of pneumonia among children under 5 years of age it had appeared that two-thirds of them had not been out of doors for a long time previous to their illness.

The endemic and epidemic appearances of pneumonia had attracted attention since 1875, when Kühn first published an essay on an epidemic in a Bavarian prison, in which most of the cases presented the pleuro-pneumonic type, often complicated by pericarditis and typhoid cerebral symptoms. Müller, in 1877, had reported the occurrence of pneumonia in three out of four inhabitants of a small house and in two relatives who had been visiting there; Ritter, in five persons, who inhabited a single house, within five days and in two visitors there; Bielinski, in nine of ten persons living in a house with only two rooms, within two weeks; Daly, in six of eight persons living in one house.

Attempts to produce pneumonia by forcing dry cold air into the lungs of animals had always failed. Efforts to determine the weather influences bearing on the frequency of the disease had been made, and led to the fact that pneumonia was most prevalent in weather which favored catarrhal inflammations of the air-passages. Low and falling temperature, high and rising humidity, and high winds were each alone capable of furnishing this influence. In Davos, with its cold dry climate, pneumonia never appeared until the melting of the snow in the spring. Taking up the direct evidences of the presence of a bacillus in pneumonia, the speaker quoted Sänger as having found Friedländer's pneumococcus in the lungs in all his fatal cases, as well as in the organs suffering from complicating inflammations (meningitis, pleurisy, endocarditis, nephritis, and pericarditis). Emmerich, after an epidemic in a prison in which one hundred and sixty-one out of eleven hundred and fifty inmates had been attacked and forty-six had died, had found this coccus between the ceilings and beneath the floors in great quantities, imbedded in very moist *débris* that had been used to fill up the spaces. He had inoculated thirty-two mice with a cultivation made from some of these germs and injected into the lung-tissue, and all had died, pronounced hepatization being found in each case. Cases of wandering pneumonia and of central pneumonia (beginning in numerous small pneumonic areas) were best explained on the theory of infection.

The adherents of the taking-cold theory had two distinct ideas; the local action of cold penetrating the lung through the ribs was believed by some to cause the inflammatory process; others believed a cooling of the whole surface of the body caused pneumonia in a reflex way by producing a sudden hyperæmia of the internal organs. Harm did not occur after the use of Esmarch's bandage, however, in amputation of the thigh, although sudden hyperæmia must be produced; nor did it follow the use of the cold bath. The cases of pneumonia lasting one and two days were perfectly explainable on the theory of infection; so were the epidemic and endemic cases. The latter also furnished evidence that the germs causing the disease were most apt to take effect in cold, moist weather. The fact that in these epidemics neighboring villages or dwellings escaped showed that the weather condition was not alone the cause. Investigations by Emmerich, Mendelssohn, Darlington, and many others had shown that Friedländer's pneumococcus throve best in warm, moist, and dirty rooms and houses. Daily scrubbing, as was customary in many prisons, favored this condition, since much of the material not removed from cracks and beneath the flooring was kept moist. The speaker believed that cold, moist weather so generally occurring when pneumonia was prevalent acted in a causative way only by keeping the very young and aged persons indoors entirely, and by preventing the ventilation of sleeping apartments. Confinement in close rooms of itself favored the development of bronchial catarrh, and this in turn made the lodgement of pneumonic germs much easier. The coughing also tended to force the pneumococci into the alveoli. As we might expect from this now well-established fact, pneumonia often complicated diseases in which the pulmonary mucous membrane was in a state of congestion, as typhoid fever, measles, and whooping-cough. On the other hand, pneumonia seldom complicated diseases such as scarlatina, diphtheria, and meningitis, in which the pulmonary mucous membrane was not so affected. The depression of the bodily forces was quite as great in the latter diseases.

The speaker closed by reiterating his belief that cold, moist, and windy weather was efficient as a cause of pneumonia, in a ma-

jority of cases, by its causing those who lived in moist and dirty houses to close the windows and doors, and so at once encourage the development of catarrhal inflammation in their bronchi and the multiplication of Friedländer's pneumococcus in the air they were to breathe, unmixed with outside air, for hours to come. His reason for the greater prevalence of pneumonia in April and May, as compared with October and November, when the temperature was similar, was that people feared the moist air of spring, closed their windows, and breathed air contaminated (in the case of filthy dwellings) by the accumulated dirt and moisture of the winter.

Dr. Francis Delafield remarked that no department of our knowledge was so uncertain as that of the causation of disease. If any advance was being made in this direction, it was that we were no longer as once willing to accept any statement that might be made regarding the etiology of a disease. We looked for well-connected data preceding any conclusion offered, and until such appeared were willing to admit our ignorance. This was especially true of pneumonia. It was true that for many years no efforts had been made to discover its cause or causes which could very well meet with success; what work had been done was not good work. Still, even yet we had arrived at no certainty, simply from our continuing to lack sufficient knowledge. It was idle to say that we knew the cause. What we did know was that pneumonia seemed to belong to a class of inflammations due to infection, whose progress was accompanied by the growth of pathogenic bacteria. We seemed to know that to cause this growth three factors were essential,—the pathogenic bacteria themselves, some exciting cause of inflammation, and a proper soil in the body of the person attacked. It was curious to observe how at different times and in different places one or the other of these three factors would take a more prominent share in producing the single result of pneumonic inflammation. Sometimes the bacteria were evidently the leading cause, as when people were much in the house and the house was a dirty one. In other cases the bacteria were abundantly present in the air breathed, yet no disease resulted unless some other exciting cause of inflammation came into play. Or, again, crowded quarters and foul air were without effect, except where a susceptibility was somehow developed or present in the individual. Then, still further, we must admit that our real knowledge concerning the bacteriology of pneumonia was now just in its infancy. As far as we were now advanced, it was probable that several bacteria were capable of causing the disease, and we were unable to classify all that were at times associated with fibrinous pneumonia. Until this was worked out (a matter of much time and labor), we had not gone far towards ultimate knowledge in the subject.

Everybody must have noticed the remarkable differences in the constitutional symptoms met with, some patients throughout seeming to have only a local inflammation, others very early appearing as if suffering from general infection in addition to the disease in the lung. This variation was one of the most characteristic features of the disease. We saw the same thing in peritonitis. In the present state of our knowledge such papers as the one Dr. Seibert had just read, bringing together as it did large collections of facts, were very valuable. At the same time it was wise to remember how ignorant we were of the facts which could give us any intelligent idea as to the cause of the disease.

Dr. L. Emmett Holt said that he had very little to add. For any one to enter this field of investigation it was eminently necessary that he should come prepared with a large array of facts and a large number of well-recorded and systematically-arranged cases. One feature of the disease he wished to allude to as a very noticeable one. This was the very great difference met with in individuals with respect to a predisposition to contract the disease after exposure to its exciting causes. Everything in the manner of living or the inherited tendencies which affected the general state of the constitution seemed also to affect the liability of that person to contract pneumonia. We saw similar differences, but no more marked ones, in children, in respect to the ease with which they could be inoculated by the vaccine virus or by the contagious element of measles and scarlatina. He believed one reason why pneumonia was more common in spring was because the constitutions of the less vigorous were then exhausted to some extent by the recent long continuance of cold weather and the changed conditions of living thereby made necessary. We most often saw malarial disease, and even so simple and functional a disease as chorea, appearing in the spring. It only showed that the causes which predisposed had been more active during the winter.

His experience also pointed strongly towards the fact that a predisposition to the disease was often the result of the character and cleanliness of the house and neighborhood where the patient resided. The prevalence of the disease in tenement-houses did not seem to indicate that pneumonia was largely due to conditions existing in-doors, especially where these included dampness and bad ventilation.

Abortive types of pneumonia were not infrequent, and this fact was quite in harmony with the theory of the infectious nature of the disease. Such cases of typhoid fever had often been described, and in a recent epidemic of scarlatina in the New York Infant Asylum in which over one hundred cases occurred, instances had been seen in which the rash lasted only half a day, and several in which no temperature above 100° F. was observed. The speaker thought it very probable that many of those obscure forms of illness in which there were high temperature only for a day or two, some cough, and the physical signs of hyperæmia of the lung, were in reality abortive cases of pneumonia.

Dr. A. F. Currier remarked that, without wishing to derogate from the value of the paper, he must confess he had felt relieved when Dr. Delafield insisted that other points must come under our consideration besides bacteria. As students of truth as a whole we should always remember that, while new knowledge was always important, the old landmarks must not be forgotten. The conclusions reached by good observers in times past could not be entirely incorrect. According to Dr. Seibert's conclusion, coachmen, letter-carriers, and truck-drivers might be supposed prepared against the disease, considering their out-door occupation, whereas, as a fact, they were very liable to it and often died of it. Here evidently cold and moisture and the susceptibility of the individual were the primary and efficient elements in the causation, as was so long recognized in days before the septic element was taken account of. As Dr. Delafield had said, the questions respecting the etiology of this disease were not settled even by those who were making careful and wide observations and subjecting them to close analysis. Others must wait until definite conclusions could be reached.

Dr. John Messenger would emphasize Dr. Delafield's remarks as to the part played by bacteria in the etiology. The predisposition seemed to him to have much to do in this direction. Thus the coachmen and draymen spoken of by Dr. Seibert commonly had systems debilitated by their habits and their general mode of life. They indulged in beer or whiskey, slept in close apartments, bathed little, and paid little attention to the disposal of the excreta of their bodies. The form of pneumonia known as croupous or fibrinous he had treated with best success by the same means which he employed in acute rheumatism. He had seen cases of this sort in which uric acid was present in the urine in large amount. But, last of all, it remained to be said that we did not know very much about it.

Dr. Seibert said that he had not meant to say that everything had been done which could be done in giving us correct and final knowledge in the subject of the etiology of pneumonia. We had not learned all there was to know about antiseptic methods in surgery, but in both these directions we had gone far enough to recognize the important part played by dirt in causing inflammatory processes in wounds and in the lungs. This was the practical and important part of his paper. It was a plea for asepsis in preventive medicine, as applied to pneumonia. Having made this first, he would then ask in what bodily soil the bacteria would grow if they had entrance. Physicians, reversing this order, spoke too much of predispositions instead of saying to the tenants of some filthy abode, "Clean this room," or else making them leave it at once and finally. The fact that pneumonia even occasionally occurred as an epidemic was enough to prove its infectious nature. It would not alter that fact whether the germ proved to be Friedländer's, Fraenkel's, or Sternberg's pneumococcus. If a child of his own took pneumonia, he would first of all see that no one slept again in the room it had been sleeping in, and would not have it used again as a living-room until the floors and walls had been renovated and a clean carpet put down. Acute rheumatism he had long considered an infectious disease, and had observed it most in dirty, damp, and warm tenement-houses. Infants in a tenement family he had seen die of it, and the father some months later. Its being best treated with salicylate of sodium was quite in line with the idea of there being a bacterium in the case.

He would have it recognized that the germs of pneumonia were in houses and not out-doors: he would have children taught to go out-doors in all weathers; he would have weak and anæmic children sent, not to school or

into a store, but into any out-door trade. He had for years past treated pneumonia with cold air; he never allowed a fire in the room while the patient slept; if the out-door air was cold, so much the better; when the crisis of the disease came, he closed the windows partially, and during convalescence had the patient in a sunny room with pure air at a moderate temperature.

PHENACETIN IN THE TREATMENT OF NEURALGIA.

According to Dr. Ott (*Zeitschrift für Therapie*, May 15, 1889), phenacetin, in doses of from 7½ to 75 grains daily, possesses most marked value, according to his experience, in the treatment of neuralgia of peripheral origin; while it is without action in treatment of neuralgia dependent upon disease of the brain or spinal cord. Dr. Ott administers the remedy in the form of a powder enclosed in capsules, in doses of 7½ grains, and has never had occasion to use larger amounts. One or two of these powders, given at intervals of an hour, are found to succeed easily in arresting suffering. His most brilliant results are stated to have been obtained through the use of phenacetin in hemicrania, and in occipital neuralgia, which so frequently occurs in women during the menstrual period, or in men as consequence of marked hemorrhoidal congestion. In one case of hemicrania he had marked success even after the patient had before taken antifebrin without avail. In pure trigeminal neuralgia it only produces transient relief, so that final resort must be had to other remedies, such as quinine, salicyl, or electricity. He reports two cases of cardialgia in which there was marked relief, as well as three cases of intercostal neuralgia. On the other hand, it produced no effect in an extremely severe case of sciatica, even though the dose was increased to 75 grains in twenty-four hours. Unfortunately, the economy appears to be accustomed to the use of phenacetin, and, after continued employment, its analgesic properties are lost.

THE TREATMENT OF DIARRHŒA IN PHTHISIS.

Dr. Polyák, of Görbersdorf, gives in the *Orvosi Hetilap* the results of some trials he has made of two recently suggested remedies in the diarrhœa of phthisis,—viz., silicate of magnesia in the form of talc which has been recommended by Debove, and lactic acid recommended by Drs. Sézary and Aune. About eight ounces of talc were well shaken up in a pint of milk, and this, or even a larger quantity, was given daily. As a rule, it arrested the diarrhœa after having been used for a couple of days, but if it was left off the diarrhœa returned. It was found, however, that patients liked the milk mixed with talc even better than ordinary milk, but it could not be taken for more than six or seven days, as after that time complaint was made of a troublesome feeling of oppression in the stomach and bowels. Dr. Polyák thinks it quite impossible that long-continued use of talc can heal intestinal ulcers. Lactic acid proved in his hands a much more satisfactory remedy. The initial dose employed was 30 grains per diem in four ounces of water; this was increased subsequently, but not more than 75 grains per diem were given. On the third day the diarrhœa and the pain were generally arrested, and during the next day or two the stools assumed their ordinary character. It was found advisable to continue to give small doses for some time longer. The patients bore the treatment well; it produced no diminution of appetite, and, unless continued for a long time, gave rise to no disagreeable symptoms. Dr. Polyák thinks it possible that even ulcers of the intestines may be healed by this means.—*Lancet*, May 18, 1889.

MECHANISM OF THE THIRD STAGE OF LABOR.

At the meeting of the Glasgow Obstetrical and Gynæcological Society, held January 23, 1889, in referring to various views which had been advanced concerning the third stage of labor, Dr. H. St. Clair Gray said he had always found a post-placental clot present (*British Medical Journal*, May 18, 1889). When the cord was tied, the blood was still being carried to the placenta by the curling arteries, so that the placenta and cord became gorged with blood, and rupture took place at the weakest portion of the tract, which was at the utero-placental tissue lying between the placenta and uterus, or in the placental sinuses, probably in the former, which was composed of single-walled cells. The placenta was thus separated at its centre, and an ordinary uterine contraction was sufficient to separate the rest. The presentation of the placenta by its edge or centre depended o

its site of attachment. In one hundred consecutive cases he tied the cord at once. The placenta was expelled spontaneously in ten minutes in all of them. In another one hundred cases, the cord was cut with sharp scissors and allowed to bleed. In all these cases the placenta had to be expressed. In this last series little or no clot was found. In twenty-five cases he introduced his hand after tying the cord, and found the placenta loose. In twenty-five cases, without tying the cord, he found the placenta attached. In twelve cases he had his finger on the placenta, and distinctly felt it bulge at the moment an assistant tied the cord. In seven cases of version performed on dead fœtuses he had found the placenta loose. The subplacental hæmatoma, therefore, played the most important part in the separation of the placenta, aided by the retraction of the placental site by the ordinary contraction of the uterus; thus, hemorrhage, to a slight extent, was a normal factor in labor.

In the discussion which followed, the Society showed itself unprepared to accept Dr. Gray's fundamental statement that the blood passed so rapidly from the maternal to the fœtal circulation. Reference was also made to the table in Dr. Barbour's paper, quoted from Champneys, which seemed to show there was little relation between the height of the placental insertion and its area of presentation.

THE USE OF BELLADONNA AND CANNABIS INDICA BY THE RECTUM IN GYNÆCOLOGICAL PRACTICE.

In the *Boston Medical and Surgical Journal* for May 23, 1889, Dr. J. W. Farlow calls attention to the value of employing the absorbing power of the rectum in different affections of the pelvic organs. The advantage of this method of treatment he finds to be especially dependent on the more perfect retention by the rectum of drugs than when they are introduced into the vagina. The remedies to which he especially refers as used in this manner are belladonna and cannabis indica. He states that belladonna has a sedative action on the uterus and pelvic contents, and relaxes rather than constipates the bowels. Its value in irritable conditions of the bladder and urethra is well known. This combination of qualities is called for in a very large number of women. Cannabis indica has somewhat similar properties, and especially for sensitive ovaries and in the various painful affections of those organs its use is often productive of much good. It has few equals in its power over nervous headaches such as women with pelvic trouble are subject to.

About the age of puberty there is frequent complaint of painful menstruation, with pelvic and general excitement, and often weakness from this after the flow has entirely ceased. Frequent micturition and headache are also very common at this time. If the excitement can be moderated, if the pelvic organs can be made less irritable, there will be less pain, less hemorrhage, less weakness, and consequently a much longer period of health between the catamenia. This Dr. Farlow believes may be accomplished through the rectal use of belladonna and cannabis indica, beginning a few days before the menstrual symptoms appear. So, also, tenderness of the ovaries, various symptoms which accompany the menopause, are often relieved by the same mode of treatment. Dr. Farlow generally orders ¼ grain each of extract of belladonna and extract of cannabis indica in a rectal suppository, to be used at night, and sometimes it is well to use one also in the morning after the bowels have moved. There are some patients who can tolerate only ⅛ grain of extract of belladonna, even by the rectum. To such smaller amounts should be given.

QUININE IN PREGNANCY.

At the meeting of the Glasgow Obstetrical and Gynæcological Society, held April 24, 1889, Dr. R. Park (*British Medical Journal*, May 25, 1889) read notes on the action of quinine in medicinal doses on the pregnant uterus, with an illustrative case. Mrs. C., aged 27, three years married, never pregnant, consulted him in August, 1886. He found her suffering from retroversion of the uterus with tender fundus. This was replaced without difficulty, and a Hodge pessary introduced, with immediate relief. She soon afterwards became pregnant. In August, 1887, when about five and a half months' pregnant, she was threatened with a miscarriage,—considerable flooding and rhythmic pains,—which subsided, however, on the administration of opium and small doses of liq. ergot. ammon., and on December 31 following she was delivered of a healthy female child. As to the cause of the hemorrhage, nothing could be elicited except that, three days previously, she had taken a

dose of quinine to relieve neuralgia. He considered that she must have taken from 10 to 15 grains, from the effects produced on the head. The patient herself stated that soon after the singing in her ears stopped she began to feel uneasy about the lower part of the abdomen. Dr. Park said that as the quinine produced such an effect in a dose within ordinary medicinal limits, it must, in smaller doses, have a distinct, though less obvious, action of the same kind. He believed that all tonics which acted on non-striated muscular fibre exerted their influence over the uterus, except when its walls were the seat of inflammatory hyperplasia.

Dr. M. Cameron stated that he had met with cases where he was inclined to attribute abortion to quinine.

Dr. G. A. Turner asked if the dose of quinine in Dr. Park's case had caused vomiting. He stated that while in practice abroad he had frequently used large doses of quinine in pregnant women, and had never seen any bad results.

Dr. A. Miller agreed pretty much with Dr. Atthill that those drugs mentioned by Dr. Park,—namely, ergot, savin, quinine, strychnine, etc., had very little effect in producing uterine contractions, even in the pregnant uterus, although he thought it not improbable that the quinine caused this threatened miscarriage.

THE ACTION OF ASTRINGENTS.

In an experimental inquiry upon the mode of action of astringents, Dr. R. Heinz, of Breslau (*Virch. Arch.*, 116, Hft. 2), finds that, as regards their property of contracting vessels, the minimum strength of solution necessary is—of corrosive sublimate .005 per cent.; of nitrate of silver, acetate of lead, and sulphate of zinc, .01 per cent.; of cupric sulphate, perchloride of iron, tannin and alum, .05 per cent.; while in respect to the degree of vascular contraction excited, they may be ranged in the following order: nitrate of silver; acetate of lead and sulphate of zinc; corrosive sublimate, cupric sulphate, perchloride of iron; tannin and alum. Upon the interesting question of the prevention of inflammation by the use of these substances, Heinz made many experiments on the mesentery of the frog. He found, in the first place, that when the exposed membrane was treated with such solutions, the leucocytes, although accumulating within the vessel along its walls, did not exude and collect outside the vessel, as in the ordinary experiment of mere exposure of the membrane, which is kept moist by salt solution. If a certain amount of inflammation were excited prior to the application of the astringent, the latter caused an immediate arrest of the process. That this was not due to the narrowing of the vessels was proved by using solutions of greater strength (*e.g.*, of tannin one-half per cent., alum two and a half per cent.), whereby dilatation of the vessels is caused. Still higher concentration of the solutions injure the tissues and excite inflammation; and yet, curiously enough, if the application of such be continued for a longer time, inflammatory action is held in check. Of two theories advanced to explain this property of astringents,—viz. (1) direct paralyzing effect on leucocytes, (2) change in the vessel walls,—Heinz adopts the latter, since the leucocytes show no evidence of loss of amœboid activity, while astringents possess the power of forming insoluble compounds with proteid substances. Moreover, nitrate of silver is well known to histologists to attack specially the cement-substance of endothelia, and this property may well operate in preventing the migration of leucocytes. The property of combining with albuminates also explains the action of astringents as caustics, and in causing coagulation, and also as more or less efficient bactericides.—*Lancet*, June 1, 1889.

A NEW METHOD OF TREATMENT WITH CREASOTE.

Dr. Schetelig writes in the *Pharmaceutische Post* for May 26, 1889, that he has been employing twenty- to thirty-per-cent. solutions of creasote in pure oil of cloves, injecting 16 minims into the subcutaneous tissue of the thigh or abdomen, and then removing the syringe from the canula, employing gentle massage ever the seat of injection, and then again injecting new amounts in the same locality. In this way he finds that he has been able to inject from four to twelve syringefuls of 16 minims without the patient experiencing any pain, or, in fact, any disagreeable consequences. He writes that he has employed this method of treatment for four months, and claims that his experience warrants the following conclusions:

First.—As regards harmlessness of large doses of creasote, when injected subcutaneously, giving from 16 to 25 minims daily f months at a time, and sometimes giving fro

30 to 45 minims at one treatment, without noticing any accumulative action.

Second.—In fourteen cases the taste of creasote was noticed in the mouth of the patient, quite independent of the quantity injected. The intervals between the injections varied from fifteen minutes to one hour, and in no case was there any disturbance of digestion complained of.

Third.—Subcutaneous injections of creasote exert a marked antipyretic action. When a small quantity of creasote is introduced under the skin of the feverish phthisical patient, the temperature is reduced from two to three degrees, or more. Ordinarily, 16 to 25 minims is sufficient, although excessively febrile temperature requires a larger dose.

Fourth.—The author adds that guajokol injected subcutaneously possesses all the properties of creasote, although only one-third or one-fourth of the quantity of the former is required.

NOVEL METHOD OF DETECTING A PERFORATION OF THE MEMBRANA TYMPANI.

In the *Boston Medical and Surgical Journal* for May 30, 1889, Dr. E. D. Spear calls attention to the following novel method of detecting a perforation of the membrana tympani:

While looking into the auditory canal in the ordinary manner, with speculum and mirror, hold a piece of clear, cold glass close to the speculum, have the patient do the "Valsalvian" experiment, and if a perforation exists the vapor of the breath will be condensed upon the glass and obscure the view.

THE TREATMENT OF HERPES ZOSTER.

In answer to a question propounded in a German dermatological journal as to the best method of cutting short herpes zoster—if indeed such a method really exists—Dr. Unna, of Hamburg, remarks that we must consider the treatment under two heads: firstly, when the vesicles have already formed, and the object is to prevent them suppurating; and, secondly, when the vesicles have not actually formed, and we wish to adopt a true abortive treatment, so as altogether to prevent their formation. In the first case the remedies to use are much the same as those which are employed for the purpose of preventing the papules of acne becoming pustular,—that is to say, for the abortive treatment of a boil. Here the most important remedy of all is sulphur, which can be applied in the form of a gelatinous paste of sulphate of zinc; other useful substances, which can be applied in the form of lotions containing spirit, are corrosive sublimate, iodoform, carbolic acid, and resorcine. For the true abortive treatment there is nothing like ichthyol mixed with water and painted over the part affected, or a strong paste of zinc and resorcine.—*Lancet*, May 18, 1889.

RHUS AROMATICUS IN THE NOCTURNAL INCONTINENCE OF URINE IN CHILDREN.

The use of this plant has been recently recommended by Max, Guinon, Burwensch, Descroizilles, and other physicians for the treatment of nocturnal incontinence of urine in children. In the *Gazette Hebdomadaire de Médecine et de Chirurgie* for May 17, 1889, Dr. Eloy likewise recommends the use of this remedy in this affection, employing either the tincture of the bark or the tincture of the leaves. The former preparation is obtained by macerating 200 parts of the bark in 800 parts of alcohol, the dose being 20 to 50 drops daily, diluted with water. The second preparation is made by the extraction of 200 parts of the leaves with 800 parts of eighty-per-cent. alcohol, the dose being 15 to 60 drops daily, either taken at one time or at intervals, diluted with water.

SULPHONAL IN MENTAL DISEASES.

Dr. Liborio Lojacono, assistant in Professor L. Bianchi's clinic for mental diseases at Palermo, has recently reported the results of some experiments which he has made with sulphonal on patients suffering from different forms of insanity. The drug was always exhibited in a single dose in water or syrup, from 1 to 1½ grammes being given to women and lads in the evening, and 2½ grammes in the daytime. In men the evening dose was from 1½ to 2½ grammes. The physiological action of the drug began to show itself in half an hour at night and in an hour during the day. It produced no great effect on the respiration or on the pulse, though there was a considerable increase in the blood-pressure. Digestion and temperature were unaffected, while neither the sensibility nor the various reflexes were modified in any way. In only one case, a woman suffering from melan-

cholia, to whom large doses (2 to 3 and 4 grammes) were given three days in succession, did any unpleasant after-effects occur; she was troubled with sickness after meals and a feeling of prostration for one day. It was never necessary to increase the dose owing to patients becoming habituated to the drug, nor did it appear to have any cumulative action. The first effect observed was that the patients became quiet, and soon sat down or went to bed; this was shortly followed by sleep, which, in the daytime, was often light and easily broken, but at night was sound and natural. The effect was found to vary according to the strength of the dose and the time at which it was given. Thus, while 1 or 1½ grammes given during the day produced little effect, the same quantity exhibited at night produced sleep lasting from five to eight hours. Two grammes during the day induced broken sleep for a few hours, but at night made the patient sleep quietly the whole night through, and sometimes even the following night. In some patients suffering from insomnia a single dose of 2½ grammes given at night produced tranquil refreshing sleep for two, three, or more nights running. In no case did the drug fail in its effect, the largest quantity required having been 2½ grammes at night and 4 grammes in the day. In addition to its power of inducing sleep, the drug had a marked effect as a general sedative. In cases of acute maniacal or hysterical delirium and epileptiform convulsions, paroxysms were either prevented or greatly mitigated; in chronic forms of insanity the effect was much less marked.—*British Medical Journal*, June 1, 1889.

THE PREMONITORY SYMPTOMS OF ALCOHOLIC PARALYSIS.

Nothing helps us so much in the treatment of a disease, if it be of such a nature as to be capable of cure or amelioration, as an early recognition of the symptoms of its conception. This statement, true with regard to most affections, assumes additional significance when we have to treat a disease like alcoholic neuritis, which can be readily cured in its early stages by the simple withdrawal of the poison, without any special treatment, but which, when fully established, may resist all treatment or prove rapidly fatal.

Alcoholic paralysis, on attaining to the stage of double wrist and ankle drop, loss of the patellar-tendon reactions, and high-stepping gait, is now readily recognized by every moderately well-informed practitioner, and accurate descriptions of it have found their way into ordinary text-books of medicine.

In the *Lancet* for June 8, 1889, Dr. James Ross calls attention to three symptoms, which he states are hardly ever, if ever, absent as forerunners of this form of paralysis, although they are by no means peculiar to poisoning by this agent, being met with in other forms of peripheral neuritis. These symptoms are: 1, disorders of the tactile sensibility of the extremities, which patients usually describe as numbness of the fingers and toes; 2, vaso-motor spasm of the extremities, named by Raynaud "local asphyxia," and which the patients refer to as "deadness" and "coldness" of the fingers and toes; 3, severe cramps, which are most frequent and severe in the muscles of the calf, although these muscles are by no means the exclusive seat of them.

EUGENIA CHEKEN.

Dr. Dessauer (*Journal de Médecine de Paris*, May 5, 1889) has employed the leaves of this plant as a tonic, expectorant, and diuretic. He prescribes this drug in infusion of ten per cent., or in a fluid extract, eighty per cent., four to five times daily, or for children he advises the use of a syrup made of 1 part of the leaves to 2 parts of syrup. He claims that it possesses antiseptic properties, and is indicated in purulent bronchitis, cystitis, and other infections of mucous membranes. He likewise refers to Rusby's recommendation as to the use of this drug in rheumatism.

THE BILIARY SECRETION IN MAN.

In the *Lancet* for June 1 and May 23, Mr. S. M. Copeman publishes an account of a biliary fistula occurring in a man, with some observations on the bile obtained from it. He finds,—1. The normal amount of bile secreted by the liver is about forty-eight ounces, or two and a half pints, per diem in a man of twelve-stone. 2. The rate of flow varies in accordance with the time of ingestion of food, there being usually a rise between one and two hours after a meal. The secretion, moreover, is not a continuous one, the bile being extruded into the gall-bladder by repeated peristaltic contractions of the bile-ducts. 3. The color of the bile in man is probably always of an

olive-green, biliverdin, and not bilirubin, being the pigment which is present in the greater quantity. 4. The amount of solids present is normally about ten per cent., this percentage being kept up by a continuous reabsorption of the bile salts from the intestine following on their secretion; the specific gravity of the bile falling when it is drained away as fast as formed, as occurs in a fistula. The amount may also be increased after the bile is first formed by absorption through the walls of the gall-bladder. 5. Bile is necessary to the assimilation of fats; but not absolutely so, although doubtless of use, for that of proteids. Its purgative action is more than doubtful. 6. The bile has no true antiseptic action, although it is able to a small extent to control putrefactive changes. 7. Stercobilin probably is formed by reduction of the bile pigments in the intestine; but urobilin appears to be formed in the liver, together with the bile pigments, by a slight change of metabolism.

SULPHONAL.

VERHOOGEN (*London Medical Recorder*, May 20, 1889) insists on the excellent results obtained with sulphonal in the treatment of certain cases of insomnia in which opiates were formally contraindicated. In doses of 15 grains, administered *per rectum*, sleep invariably supervened within twenty minutes, and lasted six hours or thereabouts. The patients complained of no disagreeable after-effects, and improved in condition. Occasionally it was found necessary to repeat the dose during the night. He mentions the case of a patient who was given the drug in this way for six weeks consecutively. The injection was usually given at 9.30 P.M. On several occasions she fell asleep before the time arrived for the injection, and this was consequently dispensed with, but it was always easy to see from her fatigued and comfortless face in the morning that the same amount of repose had not been experienced as with the drug. He asserts that no contraindication exists to the use of sulphonal. Cardiac and arthritic cases, renal and dyspeptic cases, are all amenable to its influence under all circumstances, and neither intolerance nor tolerance are to be apprehended. The usual dose is a gramme (15½ grains), and this always proved sufficient to induce sleep. It is not easily taken by the mouth on account of its relative insolubility, and it is best given suspended in tepid water *per rectum*, though it is rarely possible to secure that all the drug shall find its way into the gut. Some difference has been noted in the effects obtained from the drug, which, it is suggested, may be due to variations in the quality.

PROFESSOR KREMIANSKI'S TREATMENT OF PHTHISIS.

PROFESSOR KREMIANSKI, whose name is known in connection with the treatment of phthisis by means of the inhalation of aniline and the internal use of aniline and acetanilide, has recently published a pamphlet giving some account of the latest practice as employed in his out-patient clinic, where he has accumulated a large experience, having already treated fully a thousand cases. Latterly he has found great advantage from combining iron with his usual antiseptic treatment, seeing that it minimizes the tendency to the blue coloration so often noticed in patients who are taking aniline or antifebrin; besides, it has of course an admirable effect on the anæmic condition which is common to most phthisical patients. He also sometimes employs an ointment for rubbing in under the clavicles, consisting of aniline, boracic acid, and oil of peppermint, an ounce of each of these ingredients being combined with eight ounces of white vaseline. Professor Kremianski has sometimes been accused of sailing too close to the methods of quacks, but no one can read his published cases without being convinced that, while there is one main idea,—viz., that of attempting the destruction of the tubercle bacilli by means of substances poisonous to them, especially aniline,—Professor Kremianski's methods are eminently scientific and very far removed from the empiricism of the quack. Every case is examined and diagnosed with great care, measurements of all kinds, microscopical examinations and physical signs being recorded at frequent intervals, and each case being treated on its merits and according to the special needs and idiosyncrasies of the patient. Some interesting cases are given in the pamphlet referred to, several of which are recorded by Professor Kremianski's principal coadjutor, Dr. Goliarkhovski; and some charts showing the improvement in the temperature and general physical conditions during the progress of the treatment. In some of the cases the bacilli seemed to have disappeared, while in others their numbers had decreased to an

enormous extent. It must not be forgotten that a very important part of the treatment consists in giving the patient considerable quantities of a specially prepared meat-powder, prepared by Professor Kremianski, a notice of which appeared in the *Lancet* of October 27, 1888.—*Lancet*, June 1, 1889.

THE INFLUENCE OF ANTIPYRIN ON THE SOLUBILITY OF QUININE SALTS.

In the *American Journal of Pharmacy* for June, 1889, attention is called to the increase of solubility of quinine salts in the presence of antipyrin. TRIULZI noticed that if fifteen and a half grains of hydrochlorate of quinine were heated with six or seven and a half grains of antipyrin and thirty-two minims of water, solution takes place at 77° to 86° F.; with three to four grains of antipyrin, at 105° to 122°. Fifteen and a half grains of hydrochlorate of quinine with thirty-two minims of water, dissolves at 125.5° to 182.8°. On cooling, only the last solution deposits the quinine salt. Similar results were obtained with valerianate of quinine. This observation may be of value in preparing neutral quinine solutions for subcutaneous injections.

A NEW MODE OF ADMINISTERING COD-LIVER OIL.

M. LEFAKI calls attention to a method of administering cod-liver oil which seems to possess considerable advantage (*Journal de Médecine et de Chirurgie*, May, 1889). If equal parts of cod-liver oil and lime-water are mixed together, a milky liquid is obtained which is inodorous, has the consistency of syrup, and may be flavored at will either with lemon syrup or vanilla, or other extract. The cod-liver oil thus saponified is almost agreeable to the taste, does not adhere to the mouth, and does not leave any nauseous after-taste. In addition to these advantages saponified cod-liver oil is preferable to the various emulsions which are on the market. In the first place, it is permanent, the fluid remaining homogeneous. It is readily assimilated even by weak stomachs; it may be administered even during diarrhœa; besides, it is combined with calcareous elements, which are likewise indicated in the affections which call for the use of the cod-liver oil. Of course, the saponified oil may be associated with the phosphates or the hypophosphites of lime. Finally, it may be readily and rapidly prepared, and is of low price.

THE TOXIC ACTION OF CHROMIC ACID AS A CAUTERANT.

At the meeting of the American Association of Genito-Urinary Surgeons, held at Newport, May 21 and 22, 1889, DR. J. WILLIAM WHITE, of Philadelphia, sent a paper with this title to be read (*New York Medical Journal*, June 8, 1889). The author stated that for years he had been in the habit of using the above-named agent in obstinate cases of recurrent vegetations upon the genitals. Although such papillary growths sometimes accompanied specific discharges from the genitals and ulcers of venereal origin, yet they were not dependent upon the specific poisons of these diseases, and were often found upon persons in no way affected with any venereal taint. A young woman, an inmate of the venereal wards of the Philadelphia Hospital, last October, had a mass of vegetations of this nature covering the labia majora and nymphæ, extending up towards the pubes and down towards the anus. This mass was several inches thick. After two weeks of treatment by cold poultices and water dressings, the application of chromic acid was ordered. The solution used contained 100 grains to the ounce of water. About half an ounce of the liquid was used, the vagina and anus being protected by tampons of cotton soaked in carbolized oil. After this single application the patient passed a restless night, and called frequently for water. At 4 P.M. she rose to urinate and fell; she was carried to bed and slept three hours. Thirst continued all the morning without fever, and nausea supervened. At 3 A.M. she was pale, with cold extremities, pain in the left hypochondriac region, and fear of approaching death. The axillary temperature was 99° F. Active treatment failed to benefit her, and she died at 6.30 P.M., twenty-seven hours after the application of the acid. Intellection was preserved to the last. Little was found macroscopically at the autopsy. The stomach was distended, and its mucous membrane showed numerous fine ecchymoses, the result of vomiting. The biliary ducts were patulous. The liver was small and weighed forty ounces; a section showed the nutmeg change. The gall-bladder was distended with a very dark-colored secretion. The spleen was flabby and pale and weighed five ounces. The kidneys

were the seat of passive congestion, and their capsules were easily stripped off. Section of the vagina showed the mucous membrane dark red in color, covered with yellowish discharge, with no evidences of contact of the acid. The membranes and choroid plexus of the brain were injected. Dr. John Marshall had analyzed the viscera, with the following results: The kidneys and liver contained chromium, probably sodium chromate, which was poisonous in doses of from 1 to 3 grains. The rectus muscle was free from chromium. The chromic acid had probably combined with the sodium carbonate of the blood to form sodium chromate. The sudden death in this case, the author continued, was surprising, as the text-books contained no word of warning against the dangers of using chromic acid, while recommending its employment. Gubler, however, in the *Gazette Méd. de Paris*, 1871, had said that the absorption of chromic acid was not free from danger, and patients had been poisoned by a too extensive application to the surface of their bodies.

THE DIAGNOSIS OF PLACENTA PRÆVIA BY PALPATION OF THE ABDOMEN.

At the meeting of the Obstetrical Society of London, held June 5, 1889 (*Lancet*, June 15, 1889), a paper with the above title was read by Dr. Herbert Spencer, assistant obstetric physician to University College Hospital. Having described shortly two cases in illustration of the possibility of determining the site of the placenta by abdominal palpation when it is situated in the upper segment of the uterus, the author gave in detail seven cases of placenta prævia (all the cases he had investigated from this point of view) in which he had been able by palpation of the abdomen to diagnose the presence of the placenta in, or its absence from, the front wall of the lower segment before a vaginal examination was undertaken, the diagnosis being subsequently verified by vaginal and intra-uterine examination. The seven observations were all made in multiparæ with head presentations, before the membranes were ruptured, without the employment of an anæsthetic, and in the absence of pains. In three of the seven cases the exact site of the placenta on the front wall of the lower segment was determined by abdominal palpation, and in two of these the placenta was felt at a time when it was impossible to feel it by the vagina. In the remaining four cases the placenta was diagnosed by abdominal palpation to be absent from the front wall. In making the examination, it was recommended that the patient lie on her back, the bladder having previously been emptied; the examination should be gentle, made in the absence of pains, and prolonged over several minutes, or repeated if necessary. The following rules for making the diagnosis were formulated: In an ordinary vertex presentation (placenta in the upper segment), the occiput, forehead (at a higher level), and side of the head can, under favorable circumstances, be distinctly felt in the lower segment of the uterus by means of abdominal palpation. In a case of placenta prævia in which the head presents, the head is not felt where the placenta is situated: it is distinctly felt where the placenta is absent. In cases where the placenta is in front, the organ is felt as an elastic mass of the consistence of a wetted bath sponge, which keeps the examining fingers off the head. Its edge may be felt, and has the shape of the segment of a circle; within the circle all is obscure to the touch; outside the circle the head or other part of the child is plainly felt. Impulses to the head are not clearly felt through the placenta; impulses to the head through the placenta are distinctly felt at the spot from which the placenta is absent. The same applies to combined vaginal and abdominal examination. The author believed the method of diagnosis he had described to be of some practical importance, and solicited a more extended trial of its value.

Dr. Braxton Hicks considered that the author had done something to remove the slur, cast by the French and others, that abdominal palpation is not taught in England. Incidentally, in writing, Dr. Hicks had stated that in many cases the seat of the placenta could be identified by the hand, the placenta being on the one side and the fœtus on the other side of the relaxed uterus. In one case of placenta prævia he had diagnosed the position some weeks before it was confirmed during delivery.

Dr. Barnes thought that the paper was a valuable contribution to the art of scientific diagnosis. It was observed by others, and he had himself confirmed the observation, that when the placenta was seated in the upper zones and in front of the uterus, the uterine wall was thickened and raised at the area of placental attachment, forming a hillock, which rose above the level of the smooth surface of the uterus. This was also confirmed by auscultation.

Dr. Matthews Duncan had long and often sought to diagnose the portion of the healthy placenta during pregnancy by palpation, and had always failed. Meantime, he did not believe that it could be done; but what he had heard to-night would make him return to the subject, and he was ready to learn. In order to know what was to be expected and felt, it was necessary to divest the mind of the perception of the feeling of a born placenta, and to learn the feeling of an attached, living, healthy placenta in the uterus. The born placenta was a thrombosed cake. Tracing the cord into the uterus, as in a version, the obstetrician came to the placenta, and felt it ill-defined, soft, with a fretted, vesicular surface,—not easy, in fact, to recognize at first touch. Placenta prævia was not the best condition for the study of this supposed palpation. Far more favorable for the purpose were the conditions of advanced healthy pregnancy in a multipara with a relaxed uterus and a thin abdominal wall. If placental palpation were ever made out, it would be there. Dr. Duncan had never made it out.

Dr. Champneys asked Dr. Hicks and Dr. Barnes whether, in the cases in which they had stated that they had felt the placenta from without, they had verified their diagnosis by internal palpation, or whether they felt something which they believed to be placenta. The value of Dr. Spencer's paper lay in this verification, though the cases were few. Dr. Champneys was surprised to hear Dr. Barnes speak of diagnosis of the placental site by auscultation. In two or three cases of advanced extra-uterine pregnancy in which the placenta could be plainly felt, and in which the diagnosis was established by subsequent abdominal section, no sound was ever heard over it, though repeatedly sought for. For these and all other reasons he believed that auscultation was no guide whatever to the situation of the placenta.

Dr. John Phillips stated that in a case of Cæsarean section which had occurred in his practice, every attempt was made, on exposure of the uterus, to discover the situation of the placenta by auscultation and palpation. The evidence being negative, it was concluded that the placenta was situated at some distance from the line of incision. Yet on making the incision the placenta was found immediately beneath. This experience militated against the possibility of diagnosing the position of the placenta through the abdominal walls.

After some observations by Dr. Hayes, it was noted by Dr. Herman that in all the reported cases the fœtal head occupied the lower uterine segment. Thickening of the lower part of the uterus was easier to appreciate when the head filled that part than when it was occupied by softer and more movable parts of the fœtus. In the reported cases the placenta was described as "an elastic mass," the edge of which could be felt. Such placentæ were the exception, and, as Müller had demonstrated, were generally thinner than usual and expanded. Thus Dr. Barnes had described a placenta that enveloped the fœtus like a sac; and Dr. Hicks had noted a case where that structure occupied almost the whole inner surface of the uterus. Dr. Herman was surprised to hear Dr. Barnes speak of ascertaining the position of the placenta by auscultation. He thought that it was now conclusively proved that the uterine souffle had nothing whatever to do with the placenta. In extra-uterine pregnancy it was so rarely heard that its absence had been considered as an indication that pregnancy was extra-uterine.

Dr. William Duncan dwelt on the difficulty of diagnosing the position of the placenta by external palpation. A few months ago he performed Porro's operation. When the anterior surface of the uterus was exposed, it was not found to bulge forward, nor was it deepened in color, as should be the case, according to Dr. Spencer, when the placenta was in front; yet, on plunging the knife into the uterus, the placenta was cut through.

Dr. Boxall had made it an invariable rule to examine the abdomen with all the precautions advocated by Dr. Spencer. Yet he had rarely found palpation of any avail in determining the placental site. He had, however, investigated the position of the placental implantation by other methods, commenced five years ago. They led him to the conclusion that, while the sides, front, and back were about equally favored, the placenta tended very distinctly to avoid the two poles of the uterus. At the same time, considering that, generally speaking, a point somewhat nearer the upper than the lower pole was the selected site, and that the placenta was very rarely attached quite low down in the uterus, Dr. Boxall was not a little surprised to find the relative frequency with which the lower or dangerous zone was encroached upon, without of necessity entailing hemorrhage He could, however, call to mind no case in

which, when proved by other means to be implanted low down on the anterior wall, it had been possible to map out the position of the placenta by palpation of the abdomen.

After some remarks by the President, DR. BRAXTON HICKS said, in answer to Dr. Champneys, that for many years he had seen from time to time such proofs as led him to feel certain that the position of the placenta could be made out not infrequently. In regard to Dr. Matthews Duncan's observations he would add that, though in many cases it might be difficult to recognize this, he thought that if this paper by Dr. Spencer led to more extended observations, the author's conclusions would be established. Dr. Hicks himself first pointed out, not so very long ago, that the uterus during the whole of pregnancy was intermittently contracting and relaxing, and now that fact was fully recognized.

DR. BARNES was ready to accept Dr. Matthews Duncan's and Dr. Champneys's avowal that the placenta could not be made out by palpation as applied to themselves; but those obstetricians were not entitled to deny that others could do it.

After some remarks by DR. W. S. A. GRIFFITH, DR. SPENCER replied. He had stated in his paper that the placenta was not firm to the feel, and had likened its consistence to that of a wetted bath sponge for want of a better simile; it was a soft, elastic swelling. He was rather surprised to hear that Dr. Braxton Hicks and Dr. Barnes had long been able to feel the placenta by abdominal palpation, and had not recorded their cases. From observation of the placental souffle in normal cases and in placenta prævia he could not admit that information of diagnostic value could be obtained by auscultation. The living placenta did not differ from the dead in consistence only; it was also much larger. Dr. Spencer could confirm Dr. Champneys's statement as to the ease with which the placenta could be felt in some cases of extra-uterine gestation. The Cæsarean section and the Porro's operation cited by Dr. Phillips and Dr. William Duncan were not examined under the conditions laid down in Dr. Spencer's paper as essential; besides, they were not cases of placenta prævia. From actual measurement of specimens he did not think that the prævial placenta was unusually thin and spread out. The presenting part varied, chiefly as the result of examination or apoplexy. In one of his cases, at the eighth month the part felt by the abdomen was an inch and a half thick near the edge.

THE TREATMENT OF NASAL CATARRH.

DR. BEVERLEY ROBINSON read a paper with the above title before the meeting of the New York Clinical Society, held April 26, 1889, and his paper was published in full in the *New York Medical Journal* for June 15, 1889. Dr. Robinson's experience in the treatment of this affection has been so extensive that we abstract in full the more important of the practical points brought out in his address. In the first place, as regards douches: he maintains that while the use of the douche may cleanse the inferior turbinated bodies and a portion of the median, as usually employed it never reaches the upper part of the nasal passages; besides, it frequently gives rise to median otitis. Further, if a man has an occluded nose and uses douches, he will find that they will occlude it more. If he has a pretty free nasal cavity, they will at first tend to cleanse it, but after a week or a month it will be found that the obstruction is only temporarily relieved. As regards sprays: Dr. Robinson formerly held that the spray was curative of many nasal troubles, but now he hardly believes that it will cure any case, though sometimes it is an aid. The principal value is as a cleansing measure. Powders also for a while were believed to cure catarrh, and while they are better than douches, and even than sprays, Dr. Robinson has now likewise lost faith in them. For a year or two past he has relied more on ointments to produce curative results, the objection to them being the difficulty in their application. At present he uses a spray of carbolized oil, which has in the first place the advantages of the spray; it further possesses the advantage of an oleaginous agent, and in addition is a medicament, since it carries carbolic acid. Another method of employing medicinal agents locally is in the form of vapors. The volatile medicament may be placed in water, and when this is raised to a sufficient temperature a vapor is formed which may be inhaled. It will come in contact with all parts of the mocous membrane, and might be supposed to be an excellent method, but is nevertheless in practice a failure.

It thus seems that all these local measures are unable in many cases to relieve, much less to cure, and in such a position Dr. Robinson recommends the internal use of either cubebs, sulphur, or ammoniacum. Sulphur may be used in spray or may be taken internally in the form of sulphur waters. Cubebs may be given with the probability of being useful in cases where catarrhal dyscrasia is

apparently present, and provided the digestive organs are undisturbed. Ammoniacum is also only useful in certain cases, for in some it causes the secretions to become too thick and tenacious and hard to remove from the nose or naso-pharynx. When it is found that ointments, vapors, etc., and some judicious general medication, with proper attention to coincident or complicating affections, habits, surroundings, and all measures of good hygiene do not produce curative results, sometimes acids may avail, pain being prevented by the previous use of cocaine or rhigolene. Of the acids Dr. Robinson regards monochloracetic acid as the best for cauterizing the nasal mucous membrane. A piece of cotton may be wrapped on a steel carrier dipped into the acid and carried up and through the nasal passage, following particularly the lower meatus, or the inner margin of the middle turbinated body. The monochloracetic acid produces a slough, but the slough does not come away until the mucous membrane beneath it is so far healed that there is no danger of adhesions. Chromic acid may likewise produce good effects as a cautery, but care must be taken not to use too much of the acid at once, as too much may cause poisonous effects from absorption. This acid is more severe than the monochloracetic acid.

When the septum is the cause of the occlusion, a suitable operation must be performed for the removal of the offending portion. For such purposes the galvano-cautery is without doubt the best, provided a good instrument is employed. And if the parts have been anæsthetized with cocaine, its use is attended with neither pain nor troublesome bleeding. Dr. Robinson states that in his hands with the use of the galvano-cautery he has yet to notice anything worse than temporary adhesions produced in very narrow nasal passages. Usually when Dr. Robinson finds a septum with a prominent deviation anteriorly, he uses a Jarvis's or Weir's cutting forceps, and, after cocaine has been applied, cuts away as much tissue as is required to relieve obstructed breathing from this source. When the galvano-cautery, cutting forceps, or the saw fail to relieve the internal nasal obstruction recourse may be had to the trephine. Having a battery of sufficient power, he uses a nasal trephine, and, in cases demanding it, bores one or more holes through the projecting spurs of the septum, the ridges being pared down with suitable scissors, nippers, or even at times with a snare. This operation by means of the trephine may occasion quite smart hemorrhage; but the trephine is an excellent instrument, and, in the hands of a skilful manipulator, not likely to do harm. When a nasal polypus is present, the forceps, the wire snare, or the galvano-cautery may be used, first employing cocaine to prevent pain. The galvano-cautery or cold wire may also be employed in treating posterior hypertrophies of the turbinated bodies, but it may prove easier to try chromic acid. Strong solutions of nitrate of silver only aggravate nasal catarrh.

In the discussion which followed the reading of this paper, DR. DELAVAN stated that he thought the treatment of nasal catarrh a very important matter. He took issue with the statement that practically every one had it, and that it was not important, after all, to attempt to treat it specifically. While he would admit that some cases were not to be relieved by sprays, he thought that another class of patients having nasal catarrh were greatly relieved by them. It seemed improbable to him that all the statements made by different competent observers in regard to cures resulting from such local applications should have no basis in fact, although it might be admitted that they were fewer in number than were commonly supposed. Mild cases were commonly relieved without doubt.

He agreed with Dr. Robinson in his ideas about the means of making local applications and of doing other work in the nasal cavities. With regard to the use of oily substances, and particularly of vaseline, vaseline was very useful, but it was to be remembered that few drugs would dissolve in it. It was a bad excipient, and, moreover, it was not well absorbed. Its value was as an inert and protective substance, which would preserve the moisture of the mucous membrane and prevent it from being irritated by particles of dust, etc. But its value was limited to that of a protective. He had used with great satisfaction the petroleum preparation known as liquid albolene.

With regard to acids he would say that, while he had a certain amount of respect for the value of chromic acid, he considered it inferior to the galvano-cautery. He had in some instances used each at different times on the same patient, where the patient was himself a physician or a person of intelligence, and the galvano-cautery had always been preferred. Chromic acid was followed by more reaction, gave more pain at the time, and had no advantages of any sort to compensate for these disadvantages. The argument that the action of chromic acid w

chemically self-limited was absurd when we considered that limitation of the action of the galvano-cautery was under the absolute control of the operator. There was no doubt that of late operations had been very much overdone and improperly performed for pathological nasal conditions. Patients were constantly applying at clinics in this city for the repair of injuries and damages sustained as a result of operations attempted for the improvement of their nasal passages, and many of them had come under his own notice. He had recently seen a patient both of whose inferior turbinated bodies had become adherent to the wall of the nasal chamber through their whole extent,—a condition due to the mistaken or careless use of the galvano-cautery by some unwise operator.

With regard to the complaints so often heard about the slow healing and tardy recovery following nasal operations, it was to be borne in mind that there was no local peculiarity of tissue or other necessary cause for such delay in the healing process, and that a neglect of surgical principles in the treatment of the wound, and especially in keeping it aseptic, was usually to blame. It was indispensable that, after a nasal operation, the patient should be kept under the same conditions recognized as essential to success after the other serious operations in surgery.

In undertaking operations on the nasal septum, the speaker thought it necessary that a physician should be a competent surgeon, and that no one instrument or appliance could be looked to for the cure of a given deformity in different patients. So, in patients coming for the relief of septal malformation, the deformity varied widely in position and extent, and no one instrument was made which was adapted to every exigency that might arise in operations of this sort. The saw did best as an all-around instrument, but, where the deformity was situated high up and far back, a resection would be the only means of getting a satisfactory result; neither trephine nor gouge would do the work needed. The trephine he regarded as a beautiful little instrument, and had great respect for its value, but was compelled to recognize its disadvantages. It left behind a circular cut which lacked smoothness. Then, when starting to make an incision, it was always easy to penetrate the soft or cartilaginous tissues first met with, but behind these might be encountered bone as hard as ivory, which would give the perator much trouble. Ether was needed in a large number of these nasal operations. Neither saw nor trephine filled every indication, and he trusted we were on the eve of having some new instrument which should be even in action, efficient, rapid, and smooth, and also adapted to the hand of the non-expert operator. He had heard the disadvantages of the saw called attention to before. It was significant that, while this instrument had been so much used in France for years past, in Germany chisels and gouges were depended on almost exclusively.

As to the value of local treatment of catarrhal conditions, he did not take so hopeless a view of it as Dr. Robinson did. Operations within the nose were being overdone, as he had already said, and this, together with carelessness in after-treatment, was making them undeservedly feared. It must never be lost sight of that these were operations done very near the sensorium, done in bone too (and that supplied by the sensitive fifth nerve), and sometimes followed by severe shock. After such an operation the patient needed to be put to bed, given iron and tonics, and kept for a considerable time under the eye of the operator, instead of being left to carry out instructions himself with no one to enforce them.

Dr. W. H. Flint made some remarks in regard to the nasal douche. It was said in some quarters that it was never to be used; in others that it was always worthy of trial. He thought himself that a middle course was the true one in this matter, as it was in so many other things. He had had to do with many people troubled with nasal catarrh, and among them himself. These patients frequently asked their physician what they were to do in order to free themselves of the accumulations that formed in their nasal passages. He thought it safe and wise to tell them to use a douche occasionally for this purpose, employing a stream of salt water from a suspended bag or a syringe. The only danger was that in case the nostrils were occluded and a stream was forced in on one side some of the water might enter the Eustachian tube and give rise to irritation or inflammation in the middle ear. He had used the douche once each week for the past thirteen years to remove the accumulations from within and the dust of the streets, and had never experienced anything but relief. He knew many people who had used the douche for a long time without accident or drawback.

Dr. Robinson replied to Dr. Spaulding's question that he had frequently known pain-

ful sensations in the ears to follow the snuffing up of liquids, in some persons, but rarely suppurative otitis media. That which was most important among symptoms in those who had obstinate nasal catarrh was some trouble in the eyes or ears, loss of smell, and other possible extensions or reflex troubles; not the hawking and spitting. It was necessary that we should realize how large a class of people there was who were running every few days to the office of some specialist during periods covering weeks or months to have their nasal passages sprayed out, and who, if they were asked whether the treatment was doing them any good, would necessarily answer in the negative. These were commonly people who habitually overate, exposed themselves to draughts or wet, clothed themselves carelessly, and paid little attention to the regular action of their bowels. Quite commonly only twenty-four hours of a constipated habit was needed to bring on a nasal catarrh which would run for days. It was very significant how a blister applied over the liver to bring up the activity of the portal circulation relieved a catarrh in some persons, just as it was familiarly known to do in certain cases of epistaxis. We must regard the body differently from a mosaic table, out of which one could pick up a single piece and do with it this way or that. He must still hold to the general truth of the statement that he had made, to the effect that, as a whole, people suffered more harm from specialists than they received benefit. Taking them as a multitude, they would be better off without the treatment so given them, directed to different or perhaps many successive regions of their bodies. This principle was the more in need of recognition when it was considered that the great majority of patients who were to receive advice must take it from the general practitioner, and that ordinary catarrh was the malady from which they wished to be relieved. Nasal operations were needed, of course, in certain cases, but, like amputation and other capital operations, in proportion to the whole number of people to be treated they were rare.

AMMONIA AS AN ANTISEPTIC.

Some years ago Dr. B. W. Richardson, in a communication to the Medical Society, called attention to the antiputrescent properties of ammonia, and showed that blood, milk, and other alterable liquids could be preserved for a long time by adding to them certain quantities of solution of ammonia, and solid substances, such as fish, by keeping them in closed vessels filled with ammonia gas. Some doubts that would appear to have been raised as to the results reported, on the ground that ammonia was itself a product of decomposition, induced Dr. Gottbrecht, of the University of Greifswald, to repeat the experiments, with the result of practically confirming all Dr. Richardson's statements (*Arch. exp. Path. u. Pharm*, April, p. 385). After some preliminary experiments, in which animal matter placed in five-per-cent. ammonia solution was found free from putrescence after nearly two years, ammonium carbonate was used in the place of the free alkali for the sake of convenience. The first experiment made with the washed intestines of freshly-killed pigs showed the power of ammonium carbonate to retard putrefaction to be directly dependent upon the concentration of the solution, a one-per-cent. solution retarding it until the third day, and a ten-per-cent. solution until about the sixtieth day. When added to gelatin in which putrefaction had already been set up by inoculation, it was found that a five-per-cent. solution so modified the conditions that the putrescence ceased, and a two-and-a-half-per-cent. solution inhibited the development of bacteria, so that the liquefaction of the gelatin was practically stopped. Other experiments showed that in an atmosphere impregnated with ammonium carbonate meat could be kept for six months, and at the end of that time remain nearly unaltered. Dr. Gottbrecht also discusses the conditions under which products of putrefaction may act prejudicially to the originators of the putrefaction. He points out that cadaverine, a product of decomposition of a cadaver, in certain degrees of concentration acts as a direct poison upon the abscess coccus, and he concludes that, similarly, all products of tissue-change in living organisms can become noxious to their originators as soon as their quantity exceeds a certain limit.—*The Pharmaceutical Journal and Transactions*, June 8, 1889.

THE TREATMENT OF CHRONIC NERVOUS URTICARIA WITH ANTIPYRIN.

The common causation of urticaria is to be found in some gastro-intestinal disturbance which is properly treated by suitable diet and alkalies. Professor Hardy, however, would recognize a form of urticaria of nervous origin, in which nervous remedies are indicated,

and in which DR. NITOT (*Journal de Médecine de Paris* for June 2, 1889) would attribute almost specific curative powers to antipyrin. Dr. Nitot reports in full four cases all occurring in young women who had since early childhood been subject to attacks of urticaria, in which alkaline treatment had utterly failed to produce any relief. In one of these the eruption appeared periodically each day, and Dr. Nitot recommended the use of antipyrin in seven-and-a-half-grain doses two or three hours before the expected period of eruption. After four days of this treatment the urticaria disappeared completely, and did not return. His other cases are somewhat similar to the above, with the exception that the periodic element was not so well marked. In very chronic cases the improvement was less marked than in recent cases, though even then the cure was progressive and continuous.

CREOLINE INJECTIONS IN DYSENTERY.

DR. N. P. OSSOVSKI, of Tobolsk, in Siberia, communicates to the *Vrach* an account of a series of trials he has made of creoline injections in dysentery. The plan adopted was to place the patient on all fours, so as to relax as far as possible the abdominal pressure, and then, by means of a long, soft gutta-percha tube passed up the rectum, to inject slowly a one-half per cent. solution, or rather emulsion, of creoline, allowing this to remain as long as possible, which was, in most cases, from five minutes to half an hour, but occasionally several hours. The injection was repeated twice, and sometimes three times, a day, and in the great majority of instances very soon produced a marked improvement in the patient's condition, the tenesmus, blood, and number of stools becoming less or disappearing altogether. In some cases the dysentery was arrested, but a catarrhal condition was left. Here other treatment had to be resorted to, as injections of acetate of lead and tannic acid, together with cinchona and sulphate of soda. Creoline injections were in no case found to produce any undesirable symptoms, though they were employed in children of under a year old, one of whom was suffering from cholerina, and though they were used by Dr. Kolokoloff, a colleague of Dr. Ossovski's, of a strength double as great as that mentioned above.—*Lancet*, May 18, 1889.

Reviews.

ATLAS OF VENEREAL AND SKIN-DISEASES. By Prince A. Morrow, A.M., M.D. Fasciculi VII., VIII., IX., X., XI., XII., XIII.
New York: William Wood & Co., 1888.

These several fasciculi of this atlas now before us bear out upon the whole the favorable impression made by the earlier numbers. As with the preceding parts, these each contain five colored plates, and with many of them several figures are presented upon a single plate. Fasciculus VII., apparently the last of the parts devoted to the illustration of venereal diseases, contains several admirable representations, Plate XXXII., showing syphilis of the mucous membranes of the buccal cavity, and Plate XXXIV., of syphilitic pemphigus and polymorphous syphilide, being especially noteworthy In this number is added an excellent wood-cut, depicting chiefly the several conditions in hereditary syphilis, such as nodes, gummata, malformations of the teeth, etc.

The remaining fasciculi—VIII., IX., X., XI., XII., and XIII.—are devoted to illustrations of diseases of the skin. Plates XXXVI., XXXVII., and XL., in Part VIII., presenting comedo, milium, sudamina, the eruptions of typhus and typhoid fevers, scarlatina, and erysipelas, could scarcely be better. Plates XXXVIII. and XXXIX., of variola, varicella, rubeola, and rubella, while fair, are not as meritorious as the others of this number. In Fasciculus IX. the Plates XLII., of herpes iris, and XLIV. and XLV., of the various types of eczema, are of superior worth. Fasciculus X. contains admirable illustrations of eczema rubrum, dermatitis exfoliativa, and the bullous eruption produced by the ingestion of potassium iodide. The same favorable opinion, however, cannot be expressed of the illustrations of impetigo contagiosa and the "ulcerated hydroa from potassium bromide." The former is a poor selection, while the bromide eruption is not clearly depicted. The plates of the next part (XI.), showing the herpetic eruptions,—dermatitis, herpetiformis, pemphigus, purpura simplex, and purpura thrombotica,—are, with the exception of the last named (purpura thrombotica) satisfactory productions. One plate, however, is scarcely sufficient to convey a clear idea of the eruption of dermatitis herpetiformis, for, while the eruption may be as here pictured,

cases are, as a rule, rarely seen in which there is so much uniformity in the eruption as shown in this plate. Fasciculus XII. contains well-executed illustrations of lichen planus, lichen ruber, acne vulgaris, acne rosacea, and molluscum epitheliale; the two figures of psoriasis, from the author's own collection, are not on a par with the other plates in this number, either in selection or execution. In the thirteenth fasciculus are found representations of elephantiasis of the leg and scrotum (Plate LXI.), leucoderma, alopecia areata (Plate LXII.), keloid, fibroma (Plate LXIII.), xanthelasma, rhinoscleroma (Plate LXIV.), and xeroderma pigmentosum (Plate LXV.). In this number Plates LXI. and LXIII. are especially commendable; Plate LXV. is fair; the others are scarcely up to the standard.

In conclusion, it may be said, as already intimated, that these seven fasciculi, viewed as a whole, are of more than average merit, and the various representations are probably, in the main, as life-like as may be expected to be found outside of the clinic and consulting-rooms.

THE CEREBRAL PALSIES OF CHILDREN. A CLINICAL STUDY FROM THE INFIRMARY FOR NERVOUS DISEASES. By William Osler, M.D.
Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street, 1889.

This brochure of one hundred odd pages is based upon a thorough examination of the literature of the cerebral palsies of children, and the study of one hundred and fifty-one cases made in various Philadelphia eleemosynary institutions. Probably two-thirds of the book is taken up with descriptive notes of the various cases, and will hardly be read except by the specialist, who wishes for himself to dig out of original records the history of the important affections spoken of. The descriptions, conclusions, remarks, and miscellaneous gatherings made by Professor Osler from all his wide reading and wide clinical observation are extremely valuable, and the little book belongs to that class of treatises not very widely, or, at least, not very thoroughly, read in the present, but remaining for a century the starting-point for the study of the disease,—a mooring-post for the fastening of professional opinion,—a scientific classic that shall long hold in memory the name of its gifted author.

Correspondence.

PARIS.

(From our Special Correspondent.)

Dr. Brown-Séquard's Essence of Youth — A New Heart-Poison—Plenty of Mad Dogs in Constantinople—Poisonous Rain-Water—Tanacetic Rabies—Congresses of Hygiene and Dermography, Zoology, and Therapeutics—Exposition Items.

Dr. Brown-Séquard has created quite a sensation in medical and other circles. On the first of this month, at a meeting of the Paris Biological Society, whose president he is, he made a communication on the influence of glands on the nervous system. The subject of itself is not a sensational one, but the paper soon ran off into a most unexpected channel. He spoke substantially as follows: "Glands have in the economy another function, perhaps, besides separating from the blood used-up products to be excreted. They may at the same time secrete substances having considerable influence over the nervous system and circulation. *Prima facie* the theory is apparently confirmed by the not uncertain influence on the different functions of the nervous system exercised by the ablation of testicles, in eunuchs, for instance. To prove the hypothesis, I tried several times to graft on one animal another animal's parts containing the testicles. Once only I succeeded, with an old dog, who thereby recovered great genital vigor. Within the few months past I took up again the same investigations, only changing the procedure. Into the connective tissues of animals I injected either blood from the testicular vein, or a liquid obtained by triturations of the testicles, or even the seminal vesicles. From the fact that no accidents resulted, I concluded the injections were at least harmless. Next I practised upon myself injections with a liquid prepared from triturations of guinea-pig's testicles and the blood from the testicular vein. No other local accident occurred but slight pain and redness, and no serious complication ensued. The physiological results were most remarkable. The nervous activity increased in every way; muscular power became much superior to what it was before; intestinal and vesical secretions recovered such vigor as had long since disappeared; and capacity for intellectual labor considerably increased. In short, the general effects have been those of a new lease of young manhood. Am I the victim of a delusion or self-suggestion? Perhaps I am, but I believe not. In my opinion no other substance injected could

have acted likewise, and my conclusion is that the liquid contains a substance possessing special properties and an undoubted influence on the nervous system. I am aware that my demonstration is not strictly scientific; new and more rigorous investigations will be necessary, and animals are not adapted to the purpose because psychical phenomena cannot with them be readily brought to light. Man alone will answer; but as I am determined to try on no fellow-being such experiments, I have made them hitherto, and shall continue them on my own person." At a subsequent meeting of the same society, on June 15, alluding to the new vigor imparted to his general functions, Dr. Brown-Séquard added: "The most remarkable feature is that such changes should have taken place in the tissues of an old man, who, now 72 years of age, and long since fatigued, has found his muscular, cerebral, and spinal systems so wonderfully strengthened. Yet only dynamical effects can have been produced, since it is well known the anatomical constitution can only be modified gradually, and after a long time, while the beneficial influence of the injections was felt immediately. Since June 1 I only took one injection,—on June 4,—to see how long the influence would last. And now I may here affirm that, for the past ten days, I have experienced no decrease of my nervous or muscular powers, and no loss of organic vigor. During those ten days I have been travelling, and found myself able to stand the fatigue of the journey and long walks in a manner quite beyond my strength before I began the injections. For the present I shall not carry further the endeavor to find out how much longer the effect would endure, but propose to resume the injections to better and more fully analyze their mode of action. . . . In my present experiments I have used the juice of the gland obtained by trituration, and I think it is the liquid during the elaboration process and not the sperm itself which we are dealing with. My reason for believing so is that when the trituration liquid is injected into the tissues of animals, the effects produced are much like those observed upon myself, while nothing of the sort will be noticed with the sperm itself. Another side of the question is, whether the influence of the testicles over man's vital phenomena is not matched by the ovaries over woman's. All that is known so far of the condition of castrated women, such as are thus purposely mutilated in India or operated here for surgical reasons, tends to show they are really female eunuchs. I have been wondering whether triturated ovaries would produce on women effects similar to those I have experienced personally, and expect soon to begin the investigations under very good conditions, but would prefer they be made by others, and preferably by lady physicians, either upon themselves or other women. For this reason I appeal to the medical press to help me to elucidate this very important biological problem." It is scarcely necessary to add that Dr. Brown-Séquard's papers have made more noise in the secular than in the medical press. Some are shaking their heads at what they consider a return to the period when lion's heart was eaten to give courage and lynx's eyes to sharpen the sight. But your correspondent, who heard, on June 17, Dr. Brown-Séquard speaking at the Academy of Sciences, may assure the readers of the THERAPEUTIC GAZETTE that there is apparently nothing the matter with his mental faculties.

A new heart-poison was at the June 17 sitting brought to the attention of the Academy of Sciences by Dr. Arnaud, of the Museum, already known for his researches on ouabaïne and strophanthine. The active principle there shown in fine colorless crystals has been by him extracted from "tonguin," an ordeal poison of the Madagascar natives, and named tonghinine, from the botanical name, *Tonghinia toxifera*, of the plant producing the substance. A limited number of physiological experiments instituted by Dr. E. Gley, show the new chemical to be very poisonous, and to act on the heart, much after the fashion of ouabaïne and strophanthine. The resemblance will astonish no one, considering the tonghinia belongs, like the plants furnishing these, to the Apocyneæ family. Further and more complete investigations are in progress to ascertain the properties of the chemical and its therapeutical value.

Another legend disappearing is that of the Constantinople vagrant dogs' immunity from hydrophobia. Not only are there mad dogs in the dirty streets, but their number has of late increased to such an extent that within a short time forty-one persons bitten by rabid dogs recently applied for treatment to Dr. Zoeros-Pacha, at the Constantinople Pasteur institute.

That the first portions of the rain falling during a storm are generally impure has long been known. The time-honored advice given in text-books to those who depend upon heaven's alembic for their distilled water, to wait a while before they begin to collect the falling rain, has again been proved to be very wise by a communication recently made to the Acad-

emy of Sciences. Dr. Domingos Freire, writing from Rio de Janeiro, related that, wondering at the strange symptoms of an epidemic fever which broke out last March, it occurred to him to examine the conditions of the atmosphere. To this effect he condensed some of the air moisture during the warmest hours of a hot day. This was on March 13, corresponding to September in our hemisphere. The liquid thus obtained proved deadly to birds in very small doses,—namely, 15 minims, in less than two hours. Chemically tested, the water proved to contain ammoniacal compounds, or, at least, nitrogen so combined as to be thus transformed by caustic potash at a boiling heat. Microscopically, the water was found to contain many spores, forming dense colonies, but devoid of agglutinative matter, unaffected by aniline dyes, and possessing the characteristic Brownian motion sometimes so rapid as to render the spores invisible in the microscopic field. At the time there had been but little rain for several months, and the sanitary conditions of Rio, as is well known, are none of the best. Near the end of March torrential rains set in, and the fever soon disappeared. The atmospheric moisture, on being condensed at this period, proved to be nearly harmless to birds, and to contain but very little combined nitrogen. M. Freire's conclusions are that some epidemic outbreaks are probably due to telluric emanations partly remaining in the atmosphere, and partly condensed in an insufficient quantity of rain-water used for drinking purposes.

Some time since Dr. Peyraud, of Libourne, made interesting investigations on what he called tanacetic rabies. A number of observations made on oil of tansy (oleum tanaceti) injected into the veins of animals, led him to think he had found a substance causing a sort of artificial rabies, and consequently apt to vaccinate animals against true rabies. His memoir was presented to the Academy of Medicine, and by that body referred to a committee to examine the paper and report upon it. The following were the conclusions arrived at by the committee and accepted by the Academy: 1. Oil of tansy, when injected in certain doses into rabbits' veins, will cause a poisoning whose symptoms much resemble those of true rabies. 2. A ten-per-cent. solution of chloral, on being mixed before inoculation with the rabic virus, appears to alter, and even destroy, its virulent properties. 3. When oil of tansy is injected near the point where a rabic inoculation has been performed, it seems to act to a certain extent as an antidote. The number of cases so far observed by Dr. Peyraud is, perhaps, too small to warrant a definite conclusion, but the experiments are very interesting, and deserve to be carried on further. 4. The same remark substantially applies to the effect of chloral injections. 5. As regards the preventive value of oil of tansy injections against a subsequent inoculation of rabic virus, the experiments are still less conclusive, owing chiefly to their insufficient number. In consequence the committee were of opinion that "Dr. Peyraud should be thanked for his interesting researches, and encouraged to continue them, and endeavor to impart more precision to the method recommended by him."

The Congress of Hygiene and Dermography will be held this year in Paris from August 4 to August 11. When the sixth meeting, in 1887, at Vienna, was ready to adjourn, London was the place proposed for the seventh gathering, when the French delegates remarked that, owing to the Paris Exhibition in 1889, which would bring together many scientists and interesting materials from all parts of the world, it would be preferable to postpone the London meeting to 1891, and to meet in Paris in 1889. The assemblage allowed itself to be convinced of the necessity of a trip to the gay capital by the Seine, and accepted the invitation. Ample accommodations will be provided at the Paris Faculty of Medicine, and "delegates from all and any countries may rest assured of a cordial welcome," which means that German delegates are invited and will be courteously treated, notwithstanding all that some German papers may have been saying to the contrary. The Congress of Zoology, on the other hand, will meet, August 5 to 10, at the College of Pharmacy, under the chairmanship of M. Milne-Edwards, who is a professor in that institution. As to the Congress of Therapeutics, Materia Medica, and Pharmacy, they have—as was announced in the THERAPEUTIC GAZETTE—chosen August 1 to 5 as the date, and the Palais des Sociétés Savantes as the place of their international gathering.

Pharmacy, chemistry, and allied branches, both foreign and French, are well represented at the Exposition. Medicine can scarcely be, considering the nature of things. It is only while prospecting through the immense territory covered by the endless buildings that one now and then comes across anything of strict medical interest. Yet it may be mentioned that surgical-instrument makers now discard wooden handles, and everything indented, at present, considered nests for microbes. Polished metallic handles are the fashion, and

only very large fluting, to afford good hold, is allowed. The idea is to secure complete and easy cleaning and antisepsis. Of course metallic handles are generally hollow,—solid metal would be too heavy,—and either of pure nickel or at least nickel-plated. Such instruments will readily stand the heat of sterilizing stoves. Even the instrument-cases of the best makers now contain no velvet or such material. They are made of solid wood, curved and polished, because easier to clean thoroughly. Among usual instruments a new and improved system of articulated scissors and forceps has been presented. In therapeutics nothing very novel or striking has come out; yet there are many interesting items to be seen, but so scattered in different places that long and patient journeying will be necessary to bring the whole into a presentable shape. The Therapeutic Congress is to have, near the place of meeting, a special exhibition, all to itself, where specimens of the various drugs to be considered will be displayed.

PARIS, June 21, 1889.

BERLIN.

(From our Special Correspondent.)

Microbes of Carcinoma—Singular Effects of the Carlsbad Springs—Poisoning with Colored Jerseys—Cure of Pyæmia—A Case of Pernicious Anæmia—Barbers' Itch—On Aseptic Suppuration—Harmless Gonococci—Medical Congresses.

In spite of the doubtful laurels won by Dr. Scheurben, of the Charité, with his discovery of the alleged specific microbes of carcinoma, the chase after these germs continues unabated. The desire to have each malady represented by its specific bacillus is a deplorable and irrational outcome of the modern bacteriological school. Dr. Thoma, of Dorpat, in a recently published paper, claims to have discovered singular microbic organisms in the epithelial cells of carcinomatous tumors. The observer found small cell-like structures in the epithelial nuclei of carcinomata which differed so materially from all known kinds of cells that he felt compelled to classify them among the parasitic organisms. These microbes, for which thus far no pathogenic claim has been extended, are one-celled organisms measuring four to fifteen micromillimetres in diameter, and can be seen distinctly with the aid of hæmatoxylin, safranin, eosin, and alum-carmine. They consist of protoplasm and a nucleus, have a regular round or oval form, and show a strong refraction of light. Thoma has repeatedly seen them single or in clusters of four to six embedded in the epithelial nuclei of carcinomata of the breast, of the stomach, and the intestinal tract. No pure cultures, nor other experiments which might serve to determine the exact nature of these microbes, have thus far been reported by Thoma.

This being the season when hundreds of Americans visit the celebrated Carlsbad Springs, in Bohemia, it will probably interest you to learn of some singular effects which the Carlsbad cure produces in certain ailments. It has been found by repeated observations both in chronic gonorrhœa and chronic malaria that the use of the Carlsbad Springs changes the chronic and often latent form of the mentioned affections into an acute or subacute form. Dr. Pollatchek, of Carlsbad, has paid particular attention to this subject for a number of years and has just issued a pamphlet relating to it. In all cases of chronic or latent gonorrhœa which showed this singular exacerbation after the use of the Springs, the observer has been careful to exclude any possible new infections, and in regard to malaria it is well known that Carlsbad and its vicinity is absolutely free from a malarial character. Pollatchek would probably not have published these observations unless his views had been confirmed by the identical experience of Dr. Pisch in regard to Marienbad. In obscure gastric affections with a suspected malarial element a Carlsbad cure serves, as it were, as a diagnostic factor, and brings to light the true character of the affection. In these cases, of course, the coming forward of the malarial nature is a highly welcome phenomenon, as the ailment usually yields promptly to quinine. Less welcome probably may these effects of the Carlsbad cure be to young husbands whom the Bohemian Springs force to atone for ancient sins. The explanation of the peculiar effects of the Carlsbad Springs in chronic malarial and gonorrhœal disorders is difficult. It has been said that the sulphate of magnesium which is contained in the springs of Carlsbad, Marienbad, and Glax has something to do with this process of exacerbation. The heightened tissue-changes, brought about by the Carlsbad cure, may in some way revive, as it were, the dormant microbic causes of gonorrhœa and malaria.

In spite of the frequent occurrence of poisoning with colored articles of toilet, particularly of ladies' wear, both the public and the health authorities exhibit still a good deal of the go-as-you-please system in this respect.

There is scarcely a week passing but some cases of this sort are reported. Dr. Weyl made some interesting remarks on this subject at a recent meeting of the Berlin Medical Society. He has repeatedly detected chromate of lead in various articles of wear, and has traced intoxications to this chemical. Jerseys are often impregnated with poisonous substances, particularly with safranin, and poisoning from this source is not rare. The same substance, a derivative of tar, is in Europe frequently used to color liquors. Safranin, as experiments have shown, does not act as a poison if placed in the stomach, but proves a highly toxic agent if injected subcutaneously. In one instance, observed by Weyl, indigo-sulphate of sodium was found to be the source of poisoning. A woman presented herself for treatment at the Charité, showing œdema and inflammatory reddening of the legs. Inquiry revealed as the cause of these symptoms new stockings which she had worn for three days. All symptoms disappeared promptly after removal of the poisonous stockings in which indigo-sulphate of sodium was found present. This chemical *per se* is harmless, but on the addition of water great quantities of sulphuric acid are liberated, and, of course, produce considerable irritation. Lassar has frequently seen pityriasis rosea as the result from red jerseys, and was able to trace the poisoning to various coloring matters, particularly to chrysoidin, which is also frequently used for the dyeing of stockings. A stricter supervision of these branches of manufacture than has hitherto been practised is here clearly indicated.

Professor Rose, of the Bethanien Hospital, of Berlin, recently read before the Society of Berlin Surgeons an interesting paper on pyæmia, in which he advocated greater therapeutic efforts in the treatment of that affection. Formerly pyæmia was regarded as an almost invariably fatal complication of a disease. Since the publication of Roch's labors on the treatment of surgical infections, a new light has been thrown on the nature of the pyæmic process. Roch has succeeded in producing the affection artificially in rabbits, and showed that the pyæmic process was identical in animals and man, presenting in either instance infarcts of the lungs, swelling of the spleen, and remote metastases. The contagious character of the disease was shown by Roch to disappear if the virus used was greatly attenuated. The blood was shown to be able to destroy a small quantity of the cocci of pyæmia, while in the presence of a large quantity of these microbes the pyæmic process developed. A drawing made by Roch presents the cocci of pyæmia crowding in a venous capillary around the white blood-corpuscles and arresting the progress of the latter which leads ultimately to thrombosis. From the nature of these phenomena, Rose deducts the advisability of limiting as much as possible the number of cocci in the pyæmic processes coming under observtion. In his practice he has therefore made it a principle to destroy as soon as possible every pyæmic focus by most copious application of antiseptics and by the simultaneous exhibition of tonics. This procedure is intended not only to destroy the local pyæmic depots, but also to limit the number of cocci in the blood. Rose detailed a number of cases where this plan of treatment has preserved life, while an expectative treatment of pyæmia invariably leads to fatal results.

Dr. Meyer, of Berlin, reports a case of pernicious anæmia successfully treated by washing out of the stomach. The case occurred in a woman, 25 years of age, shortly after delivery, and was attended by extreme debility, considerable fever, a pulse of one hundred and thirty, and incessant vomiting. The patient finally grew so weak that she could not sit up any more and became wholly apathetic. Meyer tried the washing out of the stomach as advocated in pernicious anæmia by Sandoz. The washing out of the stomach was continued until the water came off clear, and about six litres had run through. After this process sleep ensued, lasting for three hours, and after awakening the patient showed a gratifying return of vital energy. The fever soon disappeared, and in ten days all graver symptoms had gone. As to the cause of the disease, Meyer believes that gastric disturbances, which so frequently accompany pregnancy and delivery, were the etiological factors in the case. It is probable that fermentative processes produce in these cases toxic substances which find their way into the circulation, and cause pernicious anæmia.

In the recently organized Dermatological Society of Berlin, Dr. Rosenthal, of this city, read an instructive paper on sycosis or barber's itch. The question whether this disorder is of parasitic origin or not has been the subject of repeated discussion. Hebra himself doubted the microbic nature of the affection. At present it is believed that the parasite known as trichophyton tonsurans is the usual cause of sycosis, though the disorder might also arise from non-parasitic causes. Blunt razors, alcoholic drinks, and spiced victuals are at present no longer regarded as possible causes of barber's

itch. It is, however, conceded that inveterate eczemata may lead to sycosis. Again, acute and chronic coryza are known to be frequently at the bottom of the affection. And as these disorders are often sequelæ of scrofulosis, the latter affection is to be regarded as a predisposing cause of sycosis. Still an eczema is not necessary as a connecting link between catarrhal affections of the nose and sycosis. In passionate snuff-takers the disorder is of frequent occurrence, and, as this habit is seldom discarded, of course, is hard to cure in these instances. Recently, Behrend has also viewed certain internal factors as cause of the disease, but has failed to specify the exact nature of these internal causes. Wertheim believed that in many instances the disease is caused by a disproportion between the thickness of the hair and the diameter of the hair-follicles, and explains the localization of sycosis in the face by the fact that in that region the vertical section of the hair is larger than that on the head. An interesting etiological view has been advanced by Hebra. He believes that during the formation of a new hair-follicle the new hair enters instead of the new follicle the neighboring old follicle, and that the presence of both the old and the young hair in a single hair-follicle causes through mechanical pressure irritation and inflammation of the follicle. Other dermatologists have assumed an intimate connection between sycosis and impetigo or acne. As to the treatment of barber's itch, internal remedies are at present regarded as useless, though French physicians are still in the habit of prescribing alkalies and arsenic for it. The local remedies, at present used, are either of a mechanical or of a medicinal nature. The former are intended to open the pustules and remove the pus, and include shaving, epilation (depilatories), scarification, massage, and the sharp spoon. The latter application has to-day been almost wholly discarded. The razor is probably the best and least painful means of opening the pustules. Numerous drugs have been tried in sycosis with more or less success, all for the purpose of softening the nodules and closing the small wounds. Rosenthal mentions among the more useful local applications ungt. Habræ, ungt. precip. alb., lanolin, salicylic plaster, the oleates (as advocated by Shoemaker), salicylate of mercury, pyrogallic acid (in ½-per-cent. alcoholic solution), naphthol (in 5-per-cent. solution of oil), chrysarobin (1 part in 30 of fat), ichthyol with potash soap (Unna's treatment), resorcin, and corrosive sublimate.

In very obstinate cases caustics, such as concentrated acetic acid, nitric and chromic acids, and silver are indicated. Rosenthal does not employ any of these remedies, but follows a treatment of his own, with which he has obtained excellent results in twenty-one cases. The advantages of his treatment are ease of application, painlessness, and rapidity of cure. He orders the seat of the affection to be closely shaved daily, and orders the following ointment to be rubbed in twice a day with the finger:

℞ Acid. tannic., gr. xlv;
Lact. sulph., ʒiss;
Zinc. ox.,
Amyl., aa ʒiv;
Vasel., ʒi.
Sig.—To be used twice daily.

This application causes in about a week the pustules to dry up and to diminish greatly in number, and in about a month a very slowly disappearing erythema is the sole remnant of the disorder. Relapses, unfortunately, are rather frequent in barber's itch.

Kaufmann has recently proven by experiment that suppuration may under certain conditions be an aseptic process. He injected under strict antiseptic precautions a sterilized solution of digitotoxin in alcohol into the cellular tissue of dogs, and produced invariably a grave phlegmonous suppuration. But no microbes could ever be detected in the pus or the surrounding tissues, either microscopically or by the inoculation test. Gravitz has made similar experiments with the same results, and believes that, wherever suppuration is caused by cocci, the cause of suppuration is not the cocci themselves, but their ptomaïnes.

Strauss found numerous gonococci in the gonorrhœal flow from a boy 16 years of age, who professed never to have had any sexual connection, but had been guilty of onanism. Strauss believes that the gonococcus is a harmless inhabitant of the urethra, and only in case of irritation the latter becomes pathogenic. Fränkel, as is well known, has claimed a similar *rôle* for his pneumococcus.

The committee in charge of the Tenth International Congress of Medicine, to take place in Berlin next year, has just been organized. Virchow, Bergmann, and Waldeyer were chosen as chairmen of the committee. The Congress will open on the 6th of August, and promises to be a grand affair.

The annual meeting of the German Physicians and Naturalists will take place this year in Heidelberg in the latter part of September.

June 17, 1889.

CHRONIC ARSENICAL POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Although I read with interest and gratification your editorial of April 15 on chronic arsenical poisoning, I feel bound to correct the impression that all the cases referred to in my paper had been observed by myself.

All but one were, in fact, communicated to me by physicians of Boston and the vicinity, in answer to inquiries on my part, though none of them had been published before.

While on the subject, I should like to add that, since the publication of the paper, several other instances have been brought to my notice, where arsenic, apparently traceable to wall-paper, has been found in the urine.

One of these was that of a gentleman, about 60 years of age, who has been under my care for a number of months. His symptoms consisted in profound and progressive anæmia, causing excessive pallor, puffiness of the face, œdema of the ankles, with great weakness, and perhaps causing also a loud and rough systolic murmur at the apex of the heart, with enlargement.

Not being satisfied with the diagnosis of an anæmia secondary to cardiac disease, and not wishing to adopt that of essential anæmia without eliminating other causes, I advised an analysis of the wall-papers, which had been put on twenty years before, by one of the best local dealers, who asserted that they were practically free from arsenic.

Fifteen papers were analyzed by Dr. Charles Harrington, of Harvard Medical College, with the result that he pronounced them about the worst lot he had ever tested.

All fifteen contained arsenic, eleven of them large amounts, and six of these very large amounts.

The papers were removed about a month ago, and the patient has been steadily and markedly gaining, so that he has in a measure resumed his business, which he had practically abandoned.

It should be said that the improvement really began shortly before the removal of the papers, under the influence of iron, large quantities of food, and bathing.

It does not appear to me, however, that this militates against the diagnosis of toxic anæmia, and, on the other hand, I do not know to what other cause an anæmia could be due, so profound as this was and so distinctly progressive in character, and yet apparently curable under simple tonics, and occurring in a man of 60, free from grave anxieties and living under thoroughly favorable conditions.

The patient had never presented characteristic local symptoms of arsenic-poisoning, and there had been no other case of serious progressive illness in the house, but the health of the rest of the family had not, on the whole, been good.

Three analyses of the urine, the last of which was made about five weeks after the removal of all the papers, showed that arsenic was being eliminated. During the time of the removal, and for a few days afterwards, the patient absented himself from the house, to avoid unnecessary exposure.

Papers recently manufactured in this vicinity are mostly free from dangerous amounts of arsenic, but this case shows that the same cannot be said of even the best papers of a few years back, with which our walls are still largely covered.

Yours truly,

JAMES J. PUTNAM.

106 MARLBORO' STREET,
BOSTON, June 13.

GLYCERIN IN DYSPEPSIA.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the *Medical Age* of February 11, 1889, I attempted to call the attention of the medical profession to the very great value of glycerin as a remedy in indigestion and dyspepsia. In addition to what I there said, I would like to make the claim in your journal that glycerin in drachm doses will be found most valuable in preventing stomach troubles in convalescence from debilitating diseases, that it will often cut short an attack of indigestion, and that it will *prevent* and *cure* a large proportion of cases of "summer diarrhœa" of children. It will also to a great extent control the vomiting of pregnancy.

I am most anxious to have these claims thoroughly tested. I am aware that new methods often appear to yield far better results in the hands of the originators than with those who subsequently use them. Therefore I request that every physician having cases of stomach weakness, acute or chronic, from whatever cause, summer diarrhœa, vomiting of pregnancy, etc., test this remedy and report results. It is simple, it is harmless, it is cheap, and it is efficient.

J. A. POLLARD, A.M., M.D.

NEHAWKA, CASS CO., NEB.,
June 20, 1889.

Notes and Queries.

CUPREINE.

Cupreine, the characteristic alkaloid of the bark of *Remijia pedunculata*, has been the subject of a thorough investigation by DR. A. OUDEMANS, JR. (*Chem.-Zeit. Rep.*, May 11, p. 143), who confirms generally the statements made respecting the alkaloid by Dr. Hesse. The composition of the alkaloid crystallized from ether and dried at 130° C. is given as $C_{19}H_{22}N_2O_2$, and when separated from an alcoholic solution by water and dried in air as $3C_{19}H_{22}N_2O_2 + H_2O$. Cupreine behaves as a diacid base, and gives with most acids two series of salts, which Dr. Oudemans distinguishes as "basic" and "neutral." With some acids, as, for instance, sulphuric acid, the alkaloid forms still another salt, containing double as much acid as the neutral salt, which is, therefore, considered an "acid" salt. The neutral and acid salts are, as a rule, pretty freely soluble in water, but the besic salts are less soluble in water, and the aqueous solutions are usually yellow, though the same basic salts give with absolute alcohol perfectly colorless solutions. The colorless solutions of neutral salts are not, however, colored by a certain quantity of basic salt which results from dilution and decomposition. The rotatory power of free anhydrous cupreine in ninety-seven per cent. alcohol is given as $[a]_d = -173.3°$.—*Pharmaceutical Journal and Transactions*, June 8, 1889.

THE NEW QUARANTINE STATION AT THE ENTRANCE TO DELAWARE BAY.

It will be remembered that Congress at its last session appropriated a considerable amount of money for the equipment of seven quarantine stations,—five for the Atlantic coast and two for the Pacific. Of this appropriation about seventy-five thousand dollars was assigned for the establishment of a thoroughly equipped station for the protection of the Delaware Bay and River. Heretofore the only safeguard against the introduction of contagion below the Lazaretto has been the little hospital of the United States Marine Hospital Service near Lewes, simply designed for the treatment of sick or wounded seamen, with no adequate provision for the isolation of those suffering from infectious diseases. So well has this service been administered, however, that it has on several occasions detained and disinfected pest-laden vessels and their crews, and thus stayed at the threshold causes which might have resulted in disastrous epidemics had they gained admission. At or near this point the Legislature of Delaware has offered to cede to the United States the land necessary for the proposed buildings and appurtenances. The secretary of the State Board of Health of Pennsylvania, Dr. Benjamin Lee, has been designated a commissioner on the part of the United States to meet commissioners appointed by the State of Delaware, and, in conjunction with them, to locate and fix the boundaries of this reservation. This preliminary will be speedily settled, and work will be begun at an early date. The fumigating steamer for the station is now in process of construction at the Pusey & Jones Company's extensive works at Wilmington, Delaware.

OXYNAPHTHOIC ACID.

The antiseptic properties of oxynaphthoic acid, or, as it is also called, naphthol-carbonic acid, is the subject of an article in a Vienna medical journal by DR. A. SCHÜCKING, who has made use of this substance in various ways. Its chemical formula is $C_{11}H_8O_3$, or $C_{10}H_6{<}^{OH}_{COOH}$. It is a light gray powder, with scarcely any smell, and almost insoluble in water, but readily soluble in alcohol, ether, caustic alkalies, and alkaline carbonates. Its antizymotic power is five times stronger than that of salicylic acid, and will prevent the putrefaction of water in which meat has been dissolved even in as small a proportion as 1 in 20,000. It is well known that the soda salt of salicylic acid is devoid of antiseptic properties, but this is not the case with the new acid. It seems, too, to be capable of being used internally without producing any disorder of the digestive apparatus. In large doses, however, it is toxic. Rabbits die after the ingestion of from 22 to 45 grains, and then present signs of stomatitis, gastro-enteritis, hyperæmia of the lungs, liver, and kidneys, also albuminuria. The acid can be detected in the urine by striking a violet, blue, or red color with nitric acid, and a blue or in proper quantity a green color with perchloride of iron. Dr. Schücking found α-oxynaphthoic

acid act very well in many cases as a substitute for iodoform, having a great advantage over the latter in being almost completely devoid of smell, besides which it appears to exert no specific action on the central nervous system, and is very much less costly. When dusted over sluggish granulations it acts as a mild caustic and stimulant. For washing out the vagina he employed a solution of the combination of the acid with phosphate of soda, the strength varying from .3 to one per cent. Dr. Schücking does not, of course, pretend that α-oxynaphthoic acid is the best antiseptic for all purposes, but brings it before the profession as a valuable addition to our present category of these remedies, especially recommending the solution with phosphate of soda.—*Lancet*, June 8, 1889.

GRAFTS OF FROG'S SKIN IN CHRONIC ULCERS.

In the *Rüsskaia Meditzina*, Nos. 41, 42, and 43, 1888, p. 649, Dr. Fëodosy Nesterovsky, of Bratzlav, speaks favorably of frog's-skin grafting, a method which was first proposed by Dr. Allen in 1884, and subsequently practised successfully by Drs. O. V. Petersen, of St. Petersburg, Perez, Baratoux, Dubousquet-Laborderie, etc. Dr. Nesterovsky relates four cases of old-standing, intractable, extensive, and deep ulcers of the leg, foot, and thigh, where, after all ordinary means had failed, the transplantation of grafts of frog's skin was invariably followed by a permanent healing in from nine to fourteen days. Dr. Nesterovsky takes an ordinary water frog, and keeps the lower portions of its body immersed in a sublimate solution (1 to 1000) for five minutes; then he pinches up a piece of skin on the abdomen with forceps, and cuts out as many grafts as are required, each the size of a finger-nail. Having washed the pieces, as well as the ulcer, with a four per cent. solution of boracic acid, he carefully places the grafts on the granulating surface, and covers the part with a layer of boracic gauze and a piece of tow, fixing the whole with wax-cloth and a starched gauze roller. The dressing is changed, and the ulcer washed first on the third or fifth day. The writer summarizes his experience as follows: 1. In all cases of extensive and badly cicatrizing ulcers, skin-grafting is indicated. 2. Skin which is quite free from glands and hair is most suitable for the purpose. 3. The frog's skin completely satisfies those conditions. 4. The method is simple, safe, easily used everywhere, cheap, and most effective. This method of grafting has, we believe, been tried with success by Mr. Stanley Boyd, of Charing Cross Hospital.—*British Medical Journal*, June 1, 1889.

SHEPHERD'S PURSE AS A HÆMOSTATIC.

Dr. K. E. Wagner publishes in the *Vrach* some observations which tend to show that the capsules of shepherd's purse (capsellæ bursæ pastoris) when made into a tincture have very considerable hæmostatic properties. The cases were of different kinds, two of them being of uterine hemorrhage, two of hæmoptysis, and one of epistaxis. In all these a marked effect was produced, the hemorrhage being either entirely arrested, or, at least, very greatly diminished. No unpleasant effects, such as headache or dyspnœa, were observed, even when 3 tablespoonfuls of the tincture were taken in the course of twenty-four hours, the usual dose being from 4 to 6 tablespoonfuls.—*Lancet*, June 8, 1889.

CREASOTE IN FLATULENT DYSPEPSIA.

As creasote is an antiseptic, it may be expected to diminish fermentation, and to this effect it is especially efficacious when associated with an alkaline salt. In the treatment of flatulent dyspepsia the following formula has been recommended by Dr. Eloy in the *Gazette Hebdomadaire de Médecine et de Chirurgie*, May 31, 1889:

> Pure creasote, gtt. x;
> Bicarbonate of sodium, gr. cxx;
> Pulverized gum arabic, q.s.
> Water, ℥v.
>
> A coffeespoonful to be given one hour after each meal.

If gastric atony and insufficient gastric secretion are supposed to be the cause of the affection, the following prescription may be used:

> Pepsine, gr. lx;
> Creasote, gtt. x;
> Subcarbonate of bismuth, gr. lx.
>
> This is to be divided into thirty packages, of which one may be given in a gelatin capsule.

A CORRECTION.

In the Therapeutic Gazette for June 15, 1889, page 406, reference is made to the use of the sulphate of calcium as a remedy for infantile convulsions, recommended by Mr. H. Valentine Knaggs, in the *Archives of Pediatrics* for May, 1889. Instead of sulphate of calcium, the sulphide of calcium is intended.

—THE—

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Original Communications.

THE MANAGEMENT OF PULMONARY PHTHISIS.

By Karl von Ruck, M.D.*

WHILE the discovery of the bacillus of tuberculosis has contributed much to the etiology, diagnosis, and prophylaxis, the treatment of the disease has not been materially advanced thereby, inasmuch as all efforts directed against the life or activity of the germ itself have thus far utterly failed. Clinically, it is well established that a certain predisposition on the part of the particular organism plays an important part in the development of phthisis, and now, as before Koch's discovery, our chief resources in prophylaxis are the means employed to prevent or overcome the predisposing conditions, and in the established disease to repair the lesions with a view to cure.

To this end many methods and remedies have been proposed, and the success attending their employment has been in proportion to their influence upon nutrition in general, and that of the respiratory and circulatory organs in particular, as will be evident to any observer who will examine the list with this view, taking the term nutrition in its widest

* Director of the Winyah Sanitarium for Diseases of the Lungs, Asheville, N. C.

sense. Even the benefits from climate are best explained by its influence upon nutrition; and, on the whole, the medical profession is unanimous in its estimation of its great value in our efforts to cure phthisis. Opinions differ, however, as to the value of particular means or methods employed, and in phthisis it makes some difference, not only as to HOW but also as to WHERE they are employed. To show "how and where" I have obtained results, which are fully equal to the best, is the object of this paper; and, in view of the great mortality from this disease, and the great difficulties encountered in its treatment, it should require no excuse for an additional paper on phthiso-therapy, if the contribution offers any prospect at all for placing the management of the disease upon a basis whereby the prospects for the individual case would be improved, and, on the whole, a greater percentage of recoveries would result.

The disproportion between the lungs and heart, as the essentials of the phthisical habitus or so-called paralytic thorax, whereby the small or weak heart is unable to carry on a sufficiently vigorous circulation to assure perfect nutrition of the lung-tissue, and especially the apices, has long since been looked upon as the essential factor in phthisis; and, although we now know the tubercle-bacillus to be the sole active agent in tubercular processes, nevertheless this theory affords the best explanation of the conditions apparently essential to the growth and development of the bacilli, and disposes at the same time of the problem of inheritance, inasmuch as this predisposition may be transmitted from similarly afflicted or phthisical parents, or those whose constitutions are otherwise seriously impaired, as, for instance, from syphilis and other severe and debilitating influences.

To overcome such disproportion, by increasing the quantity and quality of the blood, and securing sufficient heart-force for a free and unobstructed circulation, through the agency of nutrition in its widest sense, has been the underlying principle of all my management, both in private practice and in special institutions for consumptives, and I have abstained from local or general antiseptic treatment, with a view of attack upon the bacilli, so far as I found the remedies or methods to conflict with the best nutrition of the patient. And I find with increasing facilities and experience my results are as satisfactory as I could have hoped them to be some years ago, at the time when the "bacilli destruction" was so strongly advocated and sought for. Even if I could then have destroyed every germ in the tissues of my phthisical patients, it must be plain to any one that, aside from the constantly recurring infection of a most favorable soil, much would have to be accomplished to bring about the repair of the lesions in the diseased lungs, although entirely free of the tubercle germ. Of course, I fully acknowledge that a remedy harmless to the patient and destructive to this special micro-organism, in addition to our present resources, would be of inestimable benefit; but, in the absence of such, the duty of the practising physician is certainly in the line of perfecting and employing our present means, which would be none the less useful in the future should the desired specific ever be discovered.

To show the improvement in results growing out of experience, and advantages from management upon different plans and in different places, I cannot do better than refer to the following tables, which give the results of my practice for the last ten years in all cases of which I have accurate records, and in which I have been able to ascertain the final result.

The treatment of those cases who remained at home was conducted in an extremely unfavorable climate and a locality in Northern Ohio where consumption is very prevalent. Patients were advised to live an out-of-door life as far as possible, and to exercise short of fatigue. The diet was as nutritious, varied and adapted to their conditions as circumstances would permit, and, besides symptomatic treatment, such remedies were used as at the time enjoyed greatest professional favor, including the hypophosphites, cod-liver oil, arsenic, creasote, astringent and antiseptic inhalations, parenchymatous injections of phenol, and iodine, external counter-irritation, etc.; and the cases sent away for climatic benefits pursued some such treatment under the care of local physicians at the various climatic resorts. The advantages from climate are strikingly evident in the per cent. of recoveries, although it must be taken into consideration that it was chiefly the poorer class who make up the number treated at home, in whom less favorable hygienic conditions, want of good and suitable food, absence of relatively good judgment, many times the necessity for continued labor, certainly had their influence in favoring the fatal course of the disease.

In connection with these results it is fair to state that far advanced cases, with few exceptions, were not admitted. The manageme

TABLE I.—*Two Hundred and Forty-three Cases from Private Practice.*

Management and stage.	No. of cases.	Recovered.*	Per cent.	Improved and still alive.	Per cent.	Died.	Per cent.
Treated at home, early stage	94	3	3.2	2	2.2	89	94.6
Treated at home, advanced stage	88	1	1.1	0	...	87	98.9
Sent away for climate, early stage	17	4	23.5	1	5.8	12	70 0
Sent away for climate, advanced stage	44	2	4.5	2	4.5	40	90.9
Total	243	10	4.1	5	2.+	228	93.8

* By recovery in advanced cases is meant that the disease is believed to have been permanently arrested, with subsidence of symptoms and restoration of general health. This explanation applies also to tables II. and III.

TABLE II.—*Fifty-eight Cases treated in a Private Institution in the same Locality, and consequently without Climatic Advantages.*

Stage of disease.	Number.	Recovered.	Per cent.	Improved and still alive.	Per cent.	Died.	Per cent.
Early stage	32	19	59.3	9	27.5	4	12.8
Advanced stage	26	5	19.2	5	19.2	16	61.5
Total	58	24	41.5	14	24.1	20	34.5

TABLE III.—*Twenty-nine Cases treated in a Special Institution at Asheville, N. C., and under Favorable Climatic Conditions.*

Stage of disease.	Number.	Recovered.	Per cent.	Much improved, but gone home before permanent result was assured.	Per cent.	Moderately improved, and gone home.	Per cent.	No improvement, and gone home by our advice.	Per cent.	Died.	Per cent.
Early stage	3	3	100.0	0	...	0	...	0	...	0	...
Advanced stages	26	9	38.4	5	19.2	6	23	4	15.4	2	7.7
Total	29	12	41.3	5	17.2	6	20.7	4	13.7	2	7.0

TABLE IV.—*Twenty-two Cases still under Treatment in same Institution.*

Stage of disease.	Number.	Much improved and prospects favorable.	Per cent.	Moderately improved.	Per cent.	No material improvement or change either way.	Per cent.	Growing worse.	Per cent.
Early stage	6	5	88.3	1	17.7	0	...	0	...
Advanced stages	16	6	37.5	4	25.0	3	18.7	3	18.7
Total	22	11	50.0	5	22.7	3	13.6	3	13.6

was practically the same as pursued with the next class of cases, and will be described in detail further on.

Of the cases reported as recovered I am of course aware that relapses may occur in the future, but these must depend very largely upon circumstances which can be controlled. Some of the improved cases in Table III. could have been reported as recovered had they pursued their treatment long enough, and the percentage of deaths will, of course, increase by the results in the cases discharged previous to permanent arrest of the disease.

The final results in cases still under treatment bid fair to equal, if not exceed, those in the cases discharged in Table III.

The scarcity of early stage cases necessarily diminishes the *general* percentage of recoveries, and the favorable results at that period of the disease should be sufficient ground for placing such cases under proper care, and otherwise favorable conditions upon the earliest manifestations.

Comparing the results "without climatic advantage" with those obtained at Asheville, the evidence is certainly in favor of climate, as we would naturally expect; especially when it is remembered that we admit here without any discrimination as to the prospects of the cases. Several were thus admitted who arrived here in a condition that they could not even be sent back, but died in a few weeks.

The influence of climate is equally apparent in Table I. Several of the recovered cases made such recovery at Asheville; and the immunity from phthisis of the native residents is well established by the labors of Drs. Gleitsmann, Marcy, Lloyd, Segur, and others. A careful investigation of all deaths from phthisis which have occurred at Asheville within the last year,—eleven in number,—made by the writer, shows that only one can be considered as occurring in a resident, a negro; all the others came here from abroad for their health suffering from the disease.

The following table shows the result of meteorological observations made at the United States signal service station, under my charge, during last winter. These observations will be continued in the future. Observations on electric tension and percentage of ozone will be added, and monthly reports may be had of the writer upon application. The hygienic conditions of the city of Asheville are now very good, and the recent completion of a thorough system of sewerage leaves little to be desired in this direction.

Month.	Mean temperature.	Mean maximum temperature.	Mean minimum temperature.	Absolute maximum temperature.	Absolute minimum temperature.	Mean daily range of temperature.	Mean relative humidity.	Mean absolute humidity.	Number of clear and fair days.	Number of cloudy and rainy days.	Number of days without sunshine.	Number of days on which 0.01 inches or more of rain fell.	Total amount of rainfall and melted snow in inches.	Snowfall in inches.	Number of days on which .10 inches or more of snow fell.	Mean barometer corrected for altitude and temperature.	Direction of prevailing winds.	Mean force of wind on scale of 0 to 6.
November	48.40°	60.12°	40.96°	69.50°	28.40°	19.16°	64.20	8.814	23.0	7.0	3	...	3.40	0	0	30.18	N.W.	1.88
December	41.50°	54.10°	36.86°	63.40°	22.10°	17.44°	62.80	8.014	25.0	5.0	1	...	8.94	0	0	30.20	N.W.	1.40
January	38.50°	48.00°	30.30°	59.80°	13.00°	18.70°	66.30	1.966	24.0	6.0	2	9.0	2.59	.80	1	30.21	N.N.W.	.94
February	37.00°	46.73°	26.00°	69.50°	6.50°	20.73°	55.60	1.894	24.0	4.0	1	4.0	1.68	4.54	4	30.27	N.N.W.	1.18
March	45.00°	55.44°	35.72°	73.80°	21.20°	19.72°	58.40	2.190	26.0	5.0	0	7.0	.43	0	0	30.16	N.N.W.	1.06
April	56.38°	67.74°	44.12°	83.00°	28.50°	22.62°	53.44	8.754	25.0	5.0	0	7.0	1.45	0	0	30.08	N.N.W.	1.90
Total	266.78°	332.13°	212.76°	417.00°	120.10°	118.37°	360.74	13.062	147.0	32.0	6	27.0	12.53	4.74	5	181.10	.....	8.36
Mean for winter months	44.46°	55.35°	35.46°	69.50°	20.20°	19.73°	60.12	2 177	24.5	5.3	1	6.5	2.09	...	...	30.18	N.W.	139

Elevation, 2350 feet above sea-level. Latitude, 35° 36′ N.; longitude, 82° 26′ W. (Hours of observation, 7 A.M., 2 P.M., and 9 P.M.) (Self-registering maximum and minimum thermometers, with northern exposure of all instruments, protected from direct rays and radiation from the sun. Barometer correction for altitude averages about 2½ inches; the readings given are reduced to the sea-level.)

KARL VON RUCK, M.D., Observer.

The management to which I wish to call especial attention as productive of the best results in phthisis is the same as pursued by me in my institution in Ohio, and in addition to which we have here a climate which affords immunity from phthisis. Such locations exist in the United States in considerable number, and have, as a rule, one factor in common,—*i.e.*, elevation.

The favorable influence of moderate altitud

upon the action of the heart is well known, and I have observed it in most cases who hav ecome under my care since my residence here. Although at first increased, the pulse-rate soon becomes slower, the heart acts stronger and steadier, the vessels are better filled, and one of the earliest effects of this better circulation is a commonly observed increase of appetite. Under the diminished pressure and the, otherwise favorable weather, especially the large number of clear and fair days admitting of out-of-door life, the heart, under the additional influence of judicious diet and exercise, performs its functions with greater ease, circulatory disturbances disappear, failing compensation is restored, and the nutrition, both general and local, cannot but be favorably influenced.

Apart, however, from climate, and referring to Tables I. and II., I would call attention to the better results obtained under management in a special institution as compared with those in private practice. The explanation for this must lie in the constant medical supervision, whereby all indications may be promptly met and injurious influences guarded against, and in the better facilities for strictly carrying out measures resorted to, in an institution properly equipped and conducted. It is remarkable, too, in this connection, that whereas in the two hundred and forty-three cases from private practice, hæmoptysis is recorded to have occurred in thirty-nine per cent., there were only two cases of hæmoptysis in the one hundred and nine treated in institutions, and, indeed, these were due to overexertion, against which the patients had been particularly warned, and previous hemorrhage formed part of the history of twenty-one cases. Other comparisons as favorable to treatment in special institutions could be made in cases with laryngeal affections, who pursued a much better course, owing to the regular care and treatment given; and pleurisy with effusion, pneumonia and pneumothorax did not occur in any single case, whereas these complications occurred in quite a number treated in private practice.

It has, however, been urged against institutions that the congregation of a number of patients suffering of the same disease would be productive of depressing influences upon some specially sensitive natures. It must be that such sensitive natures are not frequent, for I have not found them in my cases; on the contrary, I find that newcomers take considerable encouragement from the favorable progress made by their seniors in residence. Neither is there any specially marked appearance of illness in an institution, because the frequently accompanying friends are, of course, not ill, the improved and early stage cases have nothing particularly suggestive of disease in their appearance, those very ill, as a rule, are for a considerable portion of their time in bed on account of fever, and when out of doors prefer to be placed upon some quiet spot upon the grounds or a protected place. On the whole, I believe this objection to have originated from theory rather than observation, and if it had any value, could be urged against the residence in hotels and boarding-houses of any open health resort for consumptives with even more force, as there sick people also are congregated, with no effort on the part of the owners to control them in their desire to keep up and around as long as they find strength enough to do so, appearing in the public rooms and at the dining-table coughing and expectorating, when they should be in bed; circumstances which never occur in a well-managed institution. That antiseptic precautions, with care of and disinfection of sputa, and the general hygiene of a place, under the care of a medical man, would also be more thoroughly carried out than in private boarding-houses or hotels, where, as a rule, these matters receive no attention at all, requires no special mention.

When a patient is admitted, a full history and a complete diagnosis, including examination of sputa and the urine, is obtained. If there is fever, the patient is put to bed, and its character, with the maximum and minimum, respectively, afebrile period ascertained. He receives now general advice in regard to out-of-door life and exercise, and, as to the latter, he is particularly cautioned against overexertion leading to much increased heart action and consequent injury. The amount and kind of exercise is carefully prescribed for each individual case, and becomes the subject of frequent consultation. General rules are upon the door of each room, and include especial directions regarding the care of tubercular sputa, which must never be deposited except in the special receptacles therefor provided. Patients who cannot go through their meals without cough and expectoration receive their meals in their room or upon the verandas. Alcoholic stimulants are not allowed, except upon the physician's prescription, who regulates the quantity, quality, and time for their use, when deemed necessary. The burning of gas or

lamps during sleeping hours, as vitiating the air, is prohibited, but candles are placed near each bed, so a light can easily be made, if required. The house is provided with hot-water heat, and fireplaces in addition; the temperature in winter for daytime is maintained at 70° F. in all parts, and at night at 60° to 65° F., but can be increased or diminished in every room, as may be desired. The windows during daytime, except in the coldest weather, are kept more or less open, and ventilation for each sleeping-room is provided for day and night. Bath-rooms and closets are in the house. The hygiene of the skin is carefully attended to by daily bathing with strong salt solutions, to which alcohol may be added, followed by thorough rubbing (preferably before breakfast). If the patient is too weak to go through this course before breakfast, he receives eggnog or hot milk before rising. While free of fever, he is required to spend all his time, excepting sleeping hours, out of doors, either upon the extensive porches or the grounds, but protected from wind and dust, where seats and reclining-chairs are provided for rest. The diet for patients free from fever is nutritious, palatable, and varied, and, with the exception of pastry and fried dishes, the same as well people would eat and enjoy. Milk is furnished *ad libitum*, and can be had between meals, or koumiss is furnished instead. Patients who have fever receive, as a rule, only liquid food during the hours the temperature is elevated,—koumiss, milk, soups, gruels, broths, pancreatic emulsion in milk, lactated or peptonized foods if required, and at frequent intervals.

The Management of Fever.—In all cases rest and diet is chiefly depended upon, and the rise of temperature is anticipated by sending the patient to bed, if possible, an hour before the time of rise on the previous day; his bed is brought close to the window for the admission of sunlight and fresh air. The diet is simple, and liquid if it is found that solid food influences the temperature unfavorably, or is not well digested in the presence of fever. In many cases this simple management is all that is necessary to a gradual gain of an afebrile state. In cases where this proves inefficient, the administration of wine, preferably Hungarian Tokay, an hour before the expected rise, or even whiskey or cognac, and, when necessary, repeated an hour later, with or without the application of an ice-bag over the heart after the fever has risen, will lead to the desired result; not acting like antipyretics, but by a steady influence from day to day both upon the maximum reached and upon the duration, the afebrile period is finally reached. Cases in which the rise occurs with chill receive the wine or brandy hot, and hot-water-bags are applied to the extremities in anticipation of the chill, the patient is carefully guarded from influences which chill the surface, and even the use of cold water for washing, or getting out of bed for any purpose for several hours before the expected chill, is avoided; if the ice-bag is used, much care is required in making sure that the temperature is several degrees above the normal, and the surface temperature equal, before its application. A competent attendant is required, if the chills occur during the night, to see to these particulars.

I have not used a drachm of antifebrin or antipyrin to control fever since I began to follow this course of management, and have frequently seen patients gaining in flesh steadily during the time such management was necessary, and am convinced of its superiority to the continuous use of antipyretics; the extra labor involved is amply compensated for, by the very satisfactory results. When the fever is off, the patients go out of doors and take exercise according to their strength and its influence upon the heart. Many times I have found irregular rises of temperature to be due to faulty digestion, mental excitement, or physical overexertion, and frequently to betray some indiscretion on the part of the patient. Such possibilities need to be borne in mind, and require investigation when irregular fever is present.

Gastric and intestinal catarrh, and other digestive derangements, are present in a considerable proportion of cases, when first coming under treatment, and can frequently be traced to the indiscriminate use of alcoholic stimulants or errors in diet. No material gain in nutrition is possible as long as they exist, and they receive the most painstaking care and attention by excluding injurious influences and by direct treatment if necessary. Frequently the withdrawal of alcohol and regulation of diet is sufficient; in gastric catarrh, which does not yield to medication in addition, I find that the washing out of the stomach, with or without feeding through the tube, is productive of the best results, and furnishes the best guide as to the quantity and quality of food most readily digested. In intestinal catarrh, with or without tubercular changes, a raw beef diet, toget

with milk, peptonized if necessary, or in the form of koumiss, is very useful, and the administration of Gehe's preparation of salicylate of bismuth has been more beneficial in my hands than any other remedy. Unless extensive tubercular lesions of the bowels and mesentery are preventing, or severe structural changes in the liver are interfering, these complications, as a rule, yield to proper management, and with their disappearance the patient enters upon a period of improvement.

Pulmonary hemorrhage, as stated elsewhere, rarely occurs in an institution. My practice is in accordance with the rules laid down by modern authors, and consists in rest in bed in all cases, in the milder forms, in the use of opiates to allay nervous excitement and cough, ergotin or sclerotic acid hypodermically, an ice-bag over the heart, and an additional one over the supposed source of the hemorrhage, management of diet, swallowing bits of ice, and eventually securing evacuation of bowels without straining. The patient is kept in bed until every trace of blood has disappeared from the expectoration.

In violent cases the danger of suffocation requires first consideration, and on that account we may have to abstain from hypodermics of morphine; or on the contrary, it may be necessary to exhort the patient to cough, to remove coagula from throat and larynx with the fingers, and resort to stimulants when cyanosis begins to appear. I am quite sure that some years ago I saved the life of such a case, in whom hypodermics of ether proved a most quick and powerful expectorant. During such management the means recommended for milder cases are also employed, but morphine is only given when the danger from obstruction of the air-passages is passed; subsequent management is the same. In obstinate cases other remedies are, of course, to be resorted to, and if I have occasion, in the future, shall make use of ligation of the extremities, from which Volland reports a prompt and favorable result in a very severe case.

Cough and Profuse Expectoration.—The cough does not often require special treatment, if other management, and especially that of fever, is thoroughly carried out, and at most a small Dover's powder, or minute dose of codeine, may be necessary to allay unavailing efforts at expectoration. The latter, however, when profuse, in the stage of softening and suppuration, must be favored in every way possible,—by position, inhalations, and by judicious use of stimulants; and being only a symptom, the removal of the cause is to be striven for by taking advantage of every means to check waste and improve the nutrition, as the best means we have to arrest the suppuration. The expectoration from the bronchial mucous membrane, and from formed cavities, is much diminished by a dry condition of the inspired air; and creasote, or inhalations of balsamic vapors, have frequently exerted a favorable influence in my cases. Terebene also is of occasional benefit. Out of thirteen cases treated by *Weigert's method of hot-air inhalation*, for various periods of from two weeks to three months, I have seen improvement in this respect in two cases only, and this improvement I attribute to the relatively *dry* state of the heated air, for *it is not hot air that we really administer* by this method. From experiments conducted with great care I found that the temperature claimed to be obtained for the air in the lung is only obtained in the heating chamber of the apparatus; that with the valves of the machine in place, the *inspired* air in the mouth-piece ranges from 160° to 200° F., according to the depth and rapidity of inspiration; and that the air of *expiration* (ascertained with all proper precautions) was from 97.6° to 98° F. With the valve, which prevents the return of the expired air into the heating chamber, removed, the effect became greater, especially for the air of inspiration, reaching 250° to 300° F., but the expired air never exceeded 101½°. The same temperature existed in the mouth. In the axilla it was 98½°, in the rectum 99° F. I found that with that valve removed, and the thermometer of the machine at only 200° C., the inspired air at 280° F., the sensation of heat in the mouth, throat, and trachea became almost unbearable, provoking severe cough. The rubber mouth-piece became so hot it could not be held between the lips but for a few respirations at a time. It would, therefore, appear that the heating of the air in the lung is practically impossible, and we would expect this, after considering the free circulation of blood through the lung, the minute spaces containing the air in the parenchyma, and the thereby favorable conditions for absorption of heat and equalization of temperature; and to heat the lung air or lung tissue would imply the heating of the whole quantity of blood in the body. From my observations in practice I have had no other results, except diminution of the amount of expectoration in two cases, which, as stated before, I ascribed to the relatively dry air. In all other cases the

effect was either negative or positively injurious, by producing severe cough, and irritation and extension of tubercular ulceration in the larynx, which had been in a state of healing. In no case could I observe any influence upon the number or form of the bacilli in the sputum, or upon the general health of the patients. I have seen the same diminution in quantity of expectoration from the use of chemically-dried or hot-air inhalations, three years ago, when I used these methods in my institution in Ohio, and find that, other things being equal, there exists a certain relation between a dry or moist atmosphere to the total amount expectorated. To determine this more accurately I have for some time conducted some experiments, with a view of ascertaining the amount of watery vapor exhaled from the lung at different states of humidity of the atmosphere, and although these labors are not fully completed, I have determined that the higher the dew-point of the inspired air, the less watery vapor is given off from the lungs, and that it is the *absolute* and *not the relative humidity* which stands in relation to the same, as will be seen from the above table showing the results of ten experiments.

Table showing the Relation of Absolute Humidity to the Amount of Moisture given off by the Air-Passages.

Number of experiment.	Air of inspiration.					Air of expiration.					
	Dry bulb.	Wet bulb.	Dew point.	Relative humidity.	Absolute humidity in grains of moisture for each cubic foot of air.	Dry bulb.	Wet bulb.	Dew point.	Relative humidity.	Absolute humidity in grains of moisture per each cubic foot of air.	Excess of moisture in air of expiration over air of inspiration in grains per cubic foot of air.
1	28.3	21.4	— 4	29	0.471	97.7	96.5	97.0	96	18.146	17.67
2	47.0	35.0	+ 10	22	0.873	98.0	97.0	97.0	96	18.146	17.27
3	20.0	19.5	18	93	1.160	98.0	96.8	97.5	96	17.882	16.72
4	40.0	34.5	26	57	1.676	98.0	97.1	97.0	96	18.146	16.57
5	34.0	33.0	31	90	2.034	98.0	97.2	97.0	96	18.146	16.10
6	82 8	58.7	42	23	2.955	98.0	97.1	97.0	96	18.146	15.19
7	72.5	59.4	50	45	4.077	98.0	97.5	98.0	100	18.674	14.59
8	63.0	61.0	60	89	5.746	98.0	97.9	98.0	100	18.674	12 92
9	85.4	75.5	71	63	8.241	98.0	98.0	98.0	100	18.674	10.43
10	80.3	77.8	77	89	9.964	98.0	98.0	98.0	100	18.674	8.71

But to recur to the management of softening and suppuration: it frequently taxes the powers of the patient to the uttermost, and often beyond his endurance. To keep him up depends upon the conditions of the digestive organs and those of assimilation. If these have not become seriously impaired, we can force nutrition, and the more liberal the diet can be, the better are the prospects. Additional aid results from rectal feeding and inunction of the skin with pancreatized cod-liver oil, and I have frequently been able to check the loss of flesh by these means.

Pleurisy, especially dry and circumscribed, occurs frequently in the course of phthisis, and by the resulting adhesions over softening areas or over cavities may induce a better circulation through the underlying structures by establishing anastomosis with the intercostal vessels. In the treatment, rest, with counter-irritation, is, as a rule, all that is required to relieve the pain. More extensive forms, and with effusion, I have not seen in my one hundred and nine cases treated in institutions, but have met them occasionally in private practice. Since I have treated such, after the recommendation of Robinson (*British Med. Journal*, 1883), with doses of 20 to 30 grains of chloride of sodium every two or three hours, I have not been obliged to use the aspirator in the serous forms. Purulent exudations require, of course, early evacuation and thorough drainage.

Catarrhal affections of nose and throat, and especially nasal stenosis, receive prompt attention as soon as possible after admission by proper local treatment. I am well satisfied that the relief from such conditions materially adds to better nutrition.

Tubercular processes of the larynx do best in my hands under lactic acid application or menthol, in the milder forms. I pre

to use the curette upon ulcerated surfaces, and rub in the acid or menthol pretty thoroughly. Under thorough applications of cocaine the pain is not materially increased by the curettement, and cicatrization is much more rapid. Great care is necessary to confine the acid or menthol to the surfaces intended, and it requires considerable training of the patient to make him tolerant of the necessary manipulation.

To secure a better circulation in the lungs, to provide for their better ventilation, and as a calisthenic for the respiratory muscles, I make use of *pneumatic differentiation*. In the early manifestations of the disease the results derived from this method have been satisfactory in the highest degree, the expansion of the apices becomes much better, the vital capacity increases, a better percussion note, higher position of the affected apex, with increase of the inspiratory and expiratory force, are most constant results. A similar but frequently less marked influence is obtainable in a later stage, when active processes have been arrested. I do not use, nor do I recommend, this method during the presence of active or inflammatory changes, but only under the conditions just mentioned, and believe these to be the limit of useful applicability for this method, and that much harm may result from indiscriminate or routine use of the pneumatic cabinet.

Tubercular diarrhœa and ulcerative processes of the intestine are not often amenable to treatment, and, in view of the frequent uncertainty in diagnosis, we are liable to err in the estimation of the value of remedies applied. Rest in bed, carefully regulated diet, opiates, with astringents, irrigation of the lower bowel when it appears to be the seat of disease, together with iodoform suppositories, are among the means which I have employed with more or less temporary relief.

Finally, I may say that routine methods are as reprehensible in the management of phthisis as in other affections, and that the methods indicated in this paper may require to be modified and adapted to the special conditions of individual patients.

In conclusion I feel justified in stating—

1. That the question as to how and where we would best manage phthisical patients must be answered in favor of well-conducted and equipped institutions, located in a climate possessing immunity from the disease.

2. That the establishment of such institutions is desirable at all such climatic resorts, and in addition, at places even without such immunity for patients who for any reason cannot take advantage of climate as well.

3. That, in view of our results, scientific medicine has also in phthisis complied with the demands that can reasonably be made upon it,—"to cure disease in its early stages;"—and that the responsibility for the great mortality rests with the patients and friends: and, in case of the poor classes, with the local or general government, if the professional adviser has made an early diagnosis and pointed out the best means for cure.

ASHEVILLE, N. C., May 31, 1889.

THE DIARRHŒAS OF NURSLINGS AND THEIR THERAPEUSIS.

BY G. ARCHIE STOCKWELL, M.D., F.Z.S.,
DETROIT, MICHIGAN.

SIMPLE diarrhœas, or so-called "summer complaints," in adults are usually matters of little moment, being for the most part self-limited. The reverse, however, is true of nursling infants, with whom they often assume most serious characteristics. Among the latter the mortality from this cause in some seasons assumes frightful proportions, and, if we can rely upon statistics as compiled, sixty per cent. of the death-rate is due to intestinal fluxes. This is scarcely a creditable showing for us as medical practitioners, nor to therapeutics as a science, the causes being fourfold:

First.—Because of the constantly increasing sensitive and actively nervous organism of infants, derived by heritage from parents, due further to the unhygienic engraftments of so-called "advancing civilization."

Second.—General need of familiarity with the laws of hygiene and infection, and lack of knowledge of the physiological phenomena incident to digestion and nutrition in, and in the management of, babes.

Third.—Ignorance of predisposing causes and the pathological changes induced; and

Fourth.—Imperfect understanding of therapeutics in relation to the second and third of these propositions and of the chemico-physiological changes induced by the disease, and by remedies employed with a view to relief,—consequently improper treatment.

What is diarrhœa? is a question that continually obtrudes itself, frequently without satisfactory definition, and apparently with little practical result, so far as prophylaxis and better treatment is concerned, since the

measures advocated for the most part are mere repetitions and transmogrifications of the old and so-called "classic" methods which demand astringents, opiates, carminatives, and antacids. Recently antiseptics have been added to the repertory, embodying tacit admission of its inutility; and when we review the etiology and pathology of this class of complaints, the admission becomes a positive certainty.

Ignoring specific fluxes, such as cholera infantum and those arising from organic lesions, we have to deal with what?

In the majority of instances the glib assurance that all diarrhœas are diseases due to the presence of bacteria is of little aid to either diagnosis or treatment. If microbes are, as often asserted, the vicious element, nevertheless the same causes, results, and sequels confront us as did before these infinitesimals obtained to our knowledge. Further, it is a moot question whether micro-organisms are the factors of production or merely the derivatives thereof. Like the poor, they are "always with us;" and since the definite results of the disease are known, as well as the chief factor in its rise (suppressed digestive activity), it seems almost an act of folly to grope in the dark to formulate a theory from assumption or unknown cause, and to the end of securing an unknown specific.*

In diarrhœa we have a flux that, harmless or salutary in its inception, may so far overstep physiological boundaries as to be detrimental and, perhaps, dangerous. When the latter obtains, the flux possesses a double significance in that it is not merely depleting the economy alone, but is also sapping the source of supply by interfering with the absorption of nourishment. It is now a malady that, practically, at least, "burns the candle at both ends," and the accessions of cause may be more rapid than physiological attempts at removal.

Pathological changes other than from inflammation of the gastro-intestinal mucous membrane, due to irritation in the simpler fluxes, are indefinite; but ptomaïnes may be developed indirectly through chemical changes occurring within the economy or by direct introduction from without.

Diarrhœa, from a general stand-point, may be considered as simple-acute, acute-inflammatory, and organic: *Simple-acute*, when the alvine evacuations are frequent, loose, or liquid, without admixture of serum or other sanguinolent product, and not dependent upon, or aggravated by, coexistent inflammation or lesion; *acute-inflammatory*, when derived through excessive irritation leading to diffused inflammation, accompanied by serous or other sanguinolent exudation; *organic*, when dependent upon a morbid condition of the primæ viæ, and accompanied by manifest structural changes. This somewhat arbitrary classification is adopted, not as a measurement or precise delineation of infantile intestinal fluxes, but rather as a matter of convenience, whereby all may be brought within desirable limits for discussion.

The diarrhœas with which we are chiefly concerned are of the first two classes,—viz., simple-acute and acute-inflammatory,—which may both be further subdivided as acute and acute infectious, all of which are dependent upon changes occurring in the economy of the small intestine and stomach. In nursling the larger bowel is never involved save through extension, it being chiefly a convenience, for as yet it serves little purpose save as a source of exit for the effete and noxious products of digestion and assimilation. Further, fluxes dependent upon changes in the colon and cœcum are rarely of local significance, but referable to structural degeneration and changes in other portions of the viscera or economy at large, and superimposed by inflammatory exudations of the lesser bowels as in *tuberculosis mesenterica*, for instance.

Diarrhœa may arise from:†

* "Among the micro-organisms the class *schizomycetæ* are numerously represented in the healthy and diseased intestine. Within from four to eighteen hours after birth there are large numbers of bacteria, cocci, and the *bacillus subtilis* and *bacterium coli commune* (Æscherich)—the latter in the large intestine—in the remnants of digested milk. Besides, there is the *bacterium lactis ærogenes*, to which is attributed the action of decomposing milk sugar into lactic acid, carbonic acid, and hydrogen, thus giving rise to the intestinal gases. All these facts, showing the presence of immense quantities of micro-organisms, prove, however, nothing in regard to the etiology of diseases. Thus it appears that the entrance of bacteria is not the cause of diarrhœa."—JACOBI.

† Dr. Ballard (*Brit. Med. Journal*) declares: "The essential cause of diarrhœa resides, ordinarily, in the superficial layers of the earth, where it is intimately associated with the life-processes of some micro-organism not yet detected, captured, or isolated; that the vital manifestations of such organism are dependent, among other things, perhaps, principally, upon conditions of season and on the presence of dead organic matter which is its pabulum; that, on occasion, such micro-organism is capable of getting abroad from its primary habitat, the earth, and having become air-borne, obtains opportunity for feasting on non-living organic material, and of using such organic material both as nidus and as pabulum in und

a. Indigestion and non-assimilation, later proceeding to debility and exhaustion.

b. Absorption of poisonous and unhealthy gases,—miasm, improper hygiene, etc.

c. Improper nourishment, as derived from the parent, leading to *a*.

d. Microbes or ptomaïnes, introduced from without the economy, or spontaneously developed within, through physiologico-chemical changes, due also to *a* and *b*.

e. Excessive secretion of bile or its suppression, favoring *d*.

f. Exposure to cold, damp, heat, etc., securing *d*, through *c* or *a*, or both.

g. Mental agitation and reflex irritation, promoting any or all of the foregoing.

To a proper understanding of summer fluxes must be brought a familiarity with the physiology of infantile digestion: with this microbes may be practically or wholly ignored. In nurslings there is always a primary and normal tendency to looseness of the bowels, owing,—first, to the nature of the food ingested; and second, to the fact the larger intestine, whereby the dejections might be depleted in part of their fluid constituents, are inactive to absorption, digestion and absorption being strictly confined to the stomach and lesser bowel. Digestion in the infant, to a certain extent, is rudimentary; little ptyaline is excreted before the sixth or eighth month after birth; and any food substituted for normal mother's milk that contains an excess of starch is necessarily more or less irritative, since the particles of this product pass through the intestines almost untransformed. Herein is the objection to bottle-feeding and ordinary artificial foods of all classes.*

Indigestion may be a product of either underfeeding or overfeeding, constituting improper food-supply, and, consequently, from a physiological stand-point, starvation. Continued indigestion is especially apt to induce relaxation of the mucous coat of the intestines in infants, and thus a diarrhœa that began as a simple mucous catarrh may speedily become serous, colloquative, and a lethal flux. In the milk of anæmic mothers there is frequently an excess of sugar, in which case oftentimes the solid matters are diminished, and indigestion supervenes, frequently to the obtainance of a most obstinate diarrhœa in the infant. Indeed, every non-organic and non specific diarrhœa, reflex causes excluded, no matter what the inciting factor,—whether heat, cold, improper nutriment, bacteria, ptomaïnes, etc.,—obtains only with the *sine qua non* of suppression of digestive activity. The old Scottish aphorism of the "fear of God" in connection with "open

going various phases of its life history; that in food, inside as well as outside of the human body, such micro-organism finds, especially at certain seasons, nidus and pabulum convenient for its development, multiplication, or evolution; that from food, as also from the contained organic matter of particular soils, such micro-organism can manufacture, by the chemical changes wrought therein through certain of its life-processes, a substance which is a virulent chemical poison; and that this chemical substance is, in the human body, the material cause of epidemic diarrhœa. It will be observed that this provisional hypothesis is sufficiently elastic to include, as a common cause of diarrhœa, chemical products of bacterial life manufactured indifferently within or outside of the human body. Elasticity, to this extent, of a provisional hypothesis, has been necessary for the reason that, in the present state of our knowledge, certain cases and groups of cases of diarrhœa, not distinguishable from epidemic summer diarrhœa, have now and again been found to possess the faculty of being directly communicable from person to person."

Upon the results of this inquiry Dr. Ballard suggests the chief aim in prophylaxis is: "To prevent fouling of the soil with matters out of which the material of diarrhœa can be produced; to secure domestic cleanliness, dryness and cleanliness of soil, lowering of ground-water, prevention of rise of ground-air, the free movements of air, protection of food from infection, due regulation of sewers, etc."

* All artificial foods are more or less pernicious on this account, though it is possible that some starch may be digested at a very early age,—in individual cases. Examples of infants thriving on undiluted cow's milk and upon patented foods are not rare, but such only prove that the digestive processes permit of more or less latitude, or, as Jacobi puts it, "that Nature does no routine work, and that the sum total of vital processes does not respond to certain influences like reagents in a chemical test where the same proceeding always yields the same result." Indeed, there is *no food* unless quite absurd on which certain infants *will not* thrive. Again, people insist upon giving their infants articles of food they know nothing about,—foods the composition of which is a trade secret, hence with no means of determining their adaptability. If the manufacturer deigns any explanation, it is to the effect that *his* product is the *only* one in which the proportion of albuminoids to carbohydrates is chemically and physiologically correct, and that the price is—so and so much—always exorbitant. In these matters mothers seem smitten with folly and blindness, and readily place themselves and their infants at the mercy of designing manufacturers and adventurers whose sole aim is gain, forgetting in their fears of the milkman that the wares of the latter are seldom adulterated with anything worse than water, forgetting also the trite aphorism that what is "meat" for one may prove "poison" to another. When an artificial food is demanded other than cow's milk, nothing in my experience answers so well as oat-meal water, duly strained, to which may sometimes be added a little mutton broth, and the whole peptonized if it seems desirable.

bowels," expresses theologico medically a physiological necessity, equally applicable to threatened constipation or to flux, since it is intended to convey the idea of maintenance of perfect digestive and excretive harmony; and diarrhœa, regardless of inception, is neither more or less than a flux established by Nature in an attempt to rid the economy of some effete, irritating, or poisonous matter, that primarily is a salutary process, becoming morbid only by perseverance and extension; in other words, it is "a good servant," but equally "a bad master."

Food.—The milk of woman approximately represents 87.96 parts of water to 12.04 parts of solids, the latter being divided into 2.70 casein, 3.48 fat, 5.78 sugar and salts,—sodium, potassium, magnesium, calcium, phosphorus, sulphur, iron, and silica. Cow's milk, on the contrary, which is the most common substitute for human milk, represents but 84.28 of fluids to 15.16 of solids, presenting 1.27 excess of casein and albumen, 2.99 of butter, but 1.44 less of sugar, salts, etc. It also contains a small portion of starch.

In the foregoing we find in the proportions of casein, albumen, and starch, physiological reasons for the more frequent appearance of indigestion and diarrhœa in infants that are bottle-fed upon cow's milk, which is more rich in the articles most difficult of digestion in the primæ viæ of the nursling, while the supply of blood-, bone-, and nerve-making materials (salts, sugar, etc.) are deficient. To be sure these figures are, and can be, only approximate, since in the same individual, human or animal, there are variations not only in the milk-supply but in the constituents of the milk itself. For instance, both exhibit a greater percentage of albumen, casein, and butter at night than in the morning; and it must, moreover, be remembered that the normal infant stomach is incapable of digesting more than one per cent. of casein, or more than about two and four-tenths per cent. of fat. Again, it is a well-known fact that the surroundings of the lactating individual, including food-supply, materially affect the quantity and quality of the mammary secretion. It is not, therefore, a matter of indifference how the mother or foster-parent is nourished, and as regards the cow that affords the milk-supply, brewers' grains, lush-grass, refuse slops, and like foods that are employed because of their supposed ability to increase the secretion of the udder, and also on the score of frugality, are the reverse of economical so far as the rearing of infants is concerned, to whom the milk is virtually "offering a stone" instead of giving "bread." It should be remembered, moreover, that while the immature nutritive apparatus of infants excels in absorption, it is deficient in digestion as compared with adults.

Digestion.—Since suckling infants do not masticate, and exhibit but slight evidences of salivary secretion during feeding, the diastatic effect is not instantaneous; but, on the contrary, the flow of saliva is to a considerable extent secondary to deglutition. This is the secret, after feeding, of the phenomenon denominated *druling*. Nurslings are but moderately dependent upon saliva to further the act of digestion, and the human infant makes little demand upon the parotid and submaxillary glands before the sixth or eighth month or later.

Arrived at the stomach, the milk is thoroughly mixed with the gastric secretion, when, by action of the milk-curdling ferment, the casein is coagulated, and the curd containing the fat globules floats in a clear fluid (whey) which holds in solution the salts, sugar, and albumen. As digestion progresses, the casein is turned into peptone, the fat is set free, and being partially emulsified, gives a milky or turbid color to the whey. The stomach of the nursling contributes more to digestion than that of the adult, since, when the food is of proper quality, peptones are rarely discovered in the intestines, or the remnants thereof in the pylorus: presumably also nursling stomachs may absorb nourishment directly in some degree, since, for a brief period after birth, the peptic glands of the cardiac and pyloric portions closely resemble mucipara rous follicles.

Here an important consideration in connection with diarrhœa presents itself,—viz. the quantity of water contained in the food, which quantity, as before noted, should average nearly ninety per cent. of the total milk ingested. Water is in especial demand for the formation of hydrochloric and lactic acid, and also of pepsin, and is essential to the action of the latter in forming peptones: the effect of the gastric fluids upon the casein also requires a large quantity of water; consequently any circumstance that tends to concentrate the food by reduction of fluids tends to interrupt digestion.* The caseous matter, instead of parting with its oily constituents,

* It is an old observation that water facilitates the digestion of casein; and when, in artificial experimentation, artificial digestion of caseous matters ceases, it can be re-established by the addition of water.

passes on into the duodenum, where this process is impossible, provoking irritation, abnormal stimulation, determination of circulation, ending in flux. Fat (butter), to be sure, is not digested in the stomach, but is separated and prepared for the changes that take place when it encounters the bile and pancreatic products. Again, as these last are but moderately efficient in sucklings, food too rich in fats, and that have not undergone proper changes in the stomach, prove too onerous for duodenal digestion, and secure the same pernicious effect. Indeed, it is a general observation of physiologists that derangements of nurslinghood more frequently arise from lack of sufficient water in the stomach (and consequent lack of pepsin and hydrochloric and lactic acids) than from any other causes; and lactic acid, derived from milk sugar, is the essential requirement for the first stage of digestion.

When done with the food, the stomach expels into the duodenum the residue,—viz., all starch that has not been converted into sugar, any cellulose that may be present, all parapeptones and dyspeptones resulting from proteinates, all fats, and some proportion, perhaps, of salts. These are now brought in contact with—first, the biliary secretion; and, second, the secretion of the pancreas. The remainder of the starch is thus converted into sugar, the fat is further emulsified that it may be absorbed by the intestinal villi, and the remaining albumen changed into soluble material. The two latter effects are never observed on autopsic examination of infants that have succumbed to diarrhœa, hence it is evident that this lack of digestion is a prime factor in such conditions; and further, that the pancreas, which is to a certain extent rudimentary, cannot be depended upon for the performance of its wonted function during an attack of diarrhœa. The pancreas is functional and active only when the intestinal fluids are alkaline, and this alkaline reaction depends upon the presence of sodium phosphide; consequently, when through lack of soda the fluid becomes acid, the result is a diarrhœa that interferes with, or altogether arrests the processes that tend to the formation of blood, bone, and muscle, and general exhaustion follows more or less rapidly, in accordance with the previous condition of the creature.

It is generally believed that the fat acids saponify with the alkalies of the duodenum. ' In ch case, when the alkalies are sufficiently undant to decompose fat, but not sufficient to the formation of soap, the result must needs be an excess of fatty acid; and when this occurs the alkaline intestinal fluids, especially the biliary secretion so essential to duodenal digestion, are neutralized. Thus not only is the effect of the bile present destroyed, but, in consequence thereof, less bile is secreted; the biliary products are most essential to the absorption of chyle, but are not produced in sufficient quantities when the food is but incompletely transformed. Again, since the fæces almost always exhibits slight acid reaction, it is to be supposed that this is in consequence of the completion of the digestive act, and therefore not abnormal; but this acidity in infants is increased or decreased from normal with the greatest facility.

All fat is not absorbed in the act of digestion, since a portion leaves the intestines in the form of soap, another portion as free fat acid, and still another comparatively unchanged. In diarrhœa there is a large amount of fæces, the detritus of which is principally casein and fat, with more or less intestinal epithelium. In health, on the contrary, casein simply is never present, hence its detection is *prima facie* evidence of over- (*i.e.*, too rich) feeding, or of interference with the digestive act by reason of an excess of free acid in the stomach. An important application of this fact is found in the succeeding paragraphs:

"As it is true that fat is not completely absorbed, even under the most normal circumstances; as free fat acids are easily formed and accumulated; as they are formed in moderate quantities even in healthy nurslings; as it is known that a surplus is very apt to derange digestion and assimilation, and that it even prevents the normal secretion of either of the digestive fluids, gastric or duodenal; as there is usually a superabundance of fat in the normal food of sucklings; the conclusion is that the greatest care should be taken to insure proper food-supply through the parent."—JACOBI.

It is a simple matter to secure an excess of fat, but quite a different one to secure too little or to keep within bounds; and for this reason a mother whose mammary secretion presents an excess of solids (casein, albumen, butter) may be unable to rear healthy, sturdy offspring. In such case benefit is had by giving the infant to a wet-nurse or hand-feeding with diluted and peptonized milk, or, as morning's milk is much less abundant in casein than that of evening, restricting

nursing to the early part of the day, and bottle-feeding with predigested milk towards evening and at night.

Etiology.—Healthy infants possess a tendency to looseness of the bowels, their evacuations being normally fluid or semi-liquid. This obtains for two reasons,—the condition of the intestinal tract and the nature of the food. Again, peristalsis is extremely active in the young; the blood-vessels and lymphatics are most permeable; the transformation of surface-cells rapid; the inhibitory centres deficient in development; and, finally, there is greater reflex irritability.

All these, taken in connection with the fact the action of the sphincter ani is far from being firm or powerful,—that fæces are not retained in the rectum or colon sufficiently long to permit of any material absorption of fluid constituents,—tend to explain the predisposition to intestinal flux in the young. Atop of this concatenation, we may have the quantity of digestive fluids limited, or the supply of food ingested in excess, resulting in abnormal digestion, provoking fermentation, putrefaction, and irritation; the putrefaction of albuminoids developes an excess of ptomaïnes, that, if absorbed, secure blood-poisoning and nervous reflex irritation, irrespective of direct action upon the intestines. Bouchard declares that enough ptomaïnes are produced in twenty-four hours (in health), by the act of digestion, to procure death, providing excretion were stopped and all absorbed. And T. Lauder Brunton asserts: "The alkaloids which are obtained from the decomposition of albumen are one of the chief sources of diarrhœas." The fluxes resultant upon "taking cold" are due merely to the locking up of normal secretions interfering with digestion to the production of ptomaïnes; and the same occurs from excessive heat, impure air, and improper water-supply, etc. Neither are the surroundings of the parent without influence, in which category may be enumerated exposure, overwork, improper food, and all causes that tend to modify or deteriorate the lacteal supply, or to divert nourishment from the lacteal apparatus to supply the general demands of the economy of the mother. True, many physiologists assume an active, busy mother insures a more healthy and hardy child, but this is true only within limits, and in so far as labor tends to restrain the excessive production of casein and fat in the milk. Too scanty lacteal supply, or milk that is greatly impoverished, is *starvation* to the infant. Profuse supply also tends to the *same end* by securing indigestion, if devoid of the proper amount of water, or if fed, as is usually the case, at all times and on all occasions when the child is restless. The supposed manifestations of hunger in the normal infant seven times in ten are due to thirst instead, when water answers a far better purpose than milk, which only overloads and clogs the digestive apparatus. When the food-supply falls short of the requirements of the body, and the tissue elements are insufficiently nourished, the easily-recognized and well-known effects of inanition are observed. In addition to evidence of malaise and dynamic failure and heat reduction (death by starvation is death by cold); there is diminution in the volume of the soft structures, earliest and most extreme in adipose tissue, affecting the muscles, and, finally though to a less degree, the great nerve-centres. Experiment proves also, when plenty of water is allowed, that waste takes place but slowly; but, when deprived of this fluid there is rapid expenditure. Impaired digestive power is a constant result of inefficient nourishment and a frequent precursor of tubercular diseases, particularly tabes mesenterica.

When an excess of food over the quantity required by the system is habitually consumed, it to some extent admits of storage in the body as reserve food, especially in the form of fat or adipose tissue. But there is a limit to this. When the diet is habitually in excess, and especially when it contains too great a proportion of nitrogen, there is developed a diathesis or tendency to disease, especially the various disorders of the skin. As a rule, disorders of digestion, once appearing are more or less constant. The term excess, of course, is a relative one, and has to do with the *kind* as well as the quantity of food, and also depends very much upon individual digestive capacity.

Digestive disorders, therefore, result naturally both from food unsuitable in quality or quantity, and gastric impairment or incapacity; or, to summarize, to a want of relation between the food to be digested and the organism, owing to which the latter finds itself unduly embarrassed in its duties, or entirely incompetent to perform them. The sequel in the infant is diarrhœa.

Simple acute diarrhœas, as a rule, are not febrile maladies *per se* (though by neglect they may become so), but rather partake of the nature of symptoms and warnings; the

are efforts of nature to relieve the economy of some evil in the way of excess, or poisonous or irritating material, and when such obtain, if not so profuse as to threaten exhaustion, are often self-limited and beneficial. In such there are seldom or never direct or material pathological changes, the flux being of the crapulose variety, characterized by discharges every way normal save as to fluidity, requiring little or no treatment other than restriction and dilution of food.

Other acute diarrhœas are alimentary, and may also be infectious. If of the former class, the dejections are yellow in color, small in amount, and contain much undigested matter,—casein, fat, and fatty acids. This is the chylous diarrhœa of some authors, and the sequel of gastric and duodenal disturbance and non-assimilation. Improperly cared for, especially in unhygienic surroundings, it is apt to progress into a dysenteric form, and also become infectious and perhaps epidemic. In the primary infectious form, the passages are of lighter yellow, even approaching a lemon or whitish hue, more numerous, are either acid or neutral in reaction, often fetid, and contain large numbers of microbes, which, perhaps, may play an important part in the pathogeny of the trouble. Such readily assert themselves during weaning or in infants that are continuously and improperly bottle-fed.

Another form is the diarrhœa lienteria, which may be, and often is, indicative of organic disease, probably adynamic or hereditary in origin. It is one of the characteristics of mesenteric tuberculosis, purpura, aphthæ neonatorum, etc. The passages are white at first and of some consistence, but later, occasionally and temporarily stained with bile, and extremely liquid. When not due to organic causes, the trouble lies in an alteration of the secretion of the pancreas, and perhaps that of the liver as well. The food coagulated in the stomach is not transformed into peptones by the pancreas, and passes in an undigested state.

Green and bilious diarrhœas should be classed with the alimentary, and are attended by increased biliary secretion and loose, copious stools of bright yellow, or yellow green, of decided acid reaction. They commonly arise from high temperature and impure atmosphere, usually appear during the first month succeeding birth, are not usually characterized by serious digestive derangement, and are especially prone to be self-limited, and consequently harmless.

Reflex diarrhœas also are observable, dependent upon "taking cold," dentition, etc., in which the passages may be simply mucous, but sometimes assume a serous nature, are yellow, and do not necessarily contain particles of undigested food.

Epidemic diarrhœas in general outlines resemble somewhat both the bilious and lientery, lacking, however, the flow of bile peculiar to the former; frequently they are almost or quite dysenteric in character, are usually accompanied by muco-enteritis, with intense congestion of the mucous follicles, and a generally inflamed condition of duodenum and stomach: the intestines on autopsic examination invariably contain curded milk. The passages are slightly acid, white, or white flecked with green; at first mucous, mixed with intestinal epithelium, they speedily become serous, streaked with blood, perhaps, or even decidedly sanguineous, and perhaps arise from poisoning due to specific bacilli developed through damp, the phenomena incidental to "taking cold," and from overcrowding and impure air. It is by no means rare to find such diarrhœas complicated with other ailments, such as pleuro-pneumonia, congestion of lungs, etc. They are, moreover, infectious, often truly epidemic, and frequently rapidly fatal. The facts are, all infantile nursling diarrhœas not dependent on secondary causes and organic lesions, even to cholera infantum, rarely present definite anatomical changes other than inflammation of the gastro-intestinal membrane.

In all established diarrhœas of sufficient moment to demand special therapeutic measures, there is a morbid excitability and lowered tonicity of intestinal mucous membrane, and a correspondingly rapid exudation of fluid, mucous or serous, into the alimentary tract, while the reflex excitement of the muscular coat of the bowel tends to free and, perhaps, forcible expulsion of the diarrhœal fluid, mixed with the remnants of food imperfectly digested. If serous, the loss of fluid constituent of the circulation, with its saline ingredients, provoke other morbid conditions: thus the secretions at large are diminished, perverted, or obstructed; the blood becomes thick, so that oxygenation is but imperfectly accomplished; and the train of phenomena, primary and secondary, that characterize the malady, rapidly succeed. Now follow inflammatory lesions, aphthæ of the intestines, pyrexia, and the muscular and nervous systems (brain included) become exhausted by imperfect nu-

trition, due to deficient capillary circulation dependent upon poisoning by retained secretions. Meantime, the stomach and duodenum are incapable of performing their accustomed functions, owing to determination to repay the loss entailed by the flux, and are unable to supply the fluids essential to nourishment, and thus retrieve waste, and, unless relief is obtained, collapse speedily follows to fatal ending. Post-mortem in such cases reveals the stomach and duodenum pale and flabby, or as the seat of violent inflammation: and the ileum, jejunum, and cœcum denuded of epithelium, with hemorrhagic infarctions and general low inflammatory condition; and when the dejections are clayey or have been persistently colorless, usually will be found obstruction of the ductus pancreaticus or communis choledochus. Hydrobilirubin, the coloring-matter of the fæces, depends upon the mutual reaction of the biliary and pancreatic fluids.

Again, from inanition and exhaustion, perhaps from ptomaïnic poisoning, the little patient falls into a state of stupor or coma, exhibiting puffy under eyelids, congested and half-closed eyes, pinched nose, pallid lips, and cold extremities, slow breathing, weak pulse, and retracted abdomen, or abdomen tense with gas. This frequently occurs in innoxious diarrhœa, where the discharges are abruptly checked, and affords in such case indubitable evidence of toxic origin.

Dr. Edward Ballard, who, for eight years has been studying for the government of Great Britain the causes of intestinal fluxes, reports (*British Medical Journal*) some very important observations regarding the epidemic dysenteric diarrhœas of infancy. He remarked extensive pathological changes in the bodies of infants who had died from this malady, not only in the intestines but in all the viscera, and not alone in the viscera of protracted cases, but in those of nurslings the total duration of whose illness had not exceeded twelve or fourteen hours. For the most part the intestines were empty, or only contained a little yellow fæcal matter, or a little opalescent mucoid fluid, or the surface was coated with some thick, creamy, catarrhal exudation. "The amount of obvious hyperæmia of the mucous membrane of the stomach and intestines varied; sometimes there was observed some follicular ulceration, both in the small and large intestine. Generally there was more or less inflammatory thickening of the mucosa, and even in the cases of only a few hours' duration, denudation of the epithelium, both of the stomach and intestines. Now and then ecchymoses were seen, or even a little blood effused into the alimentary canal. The solitary and agminated glands of the small intestine were mostly prominent; the mesenteric glands were enlarged. The condition of spleen varied; it was sometimes congested, or exhibited hyaline degeneration of the arteries, or swelling of the Malpighian corpuscles, with degeneration of the central portion of them. The condition of the liver varied; it was either congested, or pale and bloodless, the former condition prevailing in the short, and the latter in those of longer duration; but in every case examined, there was one invariable condition,—namely, fatty degeneration of the liver-cells, slight in cases of short (only a few hours') duration, but pronounced and extensive, or complete in all parts of the organ, when the illness had been protracted. The kidneys, even when normal to the naked eye, were invariably found to be diseased, when examined microscopically, showing inflammatory and degenerative changes, intense glomerulous and parenchymatous nephritis being demonstrated even in cases of very short duration. The lungs, although they might be in parts collapsed, presented marked evidence of acute catarrhal, or catarrhal and interstitial pneumonia. The blood may be inspissated and coagulate imperfectly. There was nothing in the microscopical investigations of the tissues, blood, or excreta to indicate that in the cases which furnished the organs, blood, or excreta sent for investigation the malady was due to any micro organism developing within the alimentary canal, or permeating any of the tissues; but it must not, therefore, be inferred that a specific micro-organism may not, in some instances, be present, and even undergo development and growth, within the body."

Commenting upon the fact that epidemic diarrhœa implicates the kidney as well as the intestinal canal, and in a manner similar to that in which scarlet fever implicates it, Dr. Ballard observes that probably in most cases of diarrhœa that recover, the morbid condition of the kidney clears up, as it does in most cases of scarlet fever that recover; but, just as in other cases of scarlet fever that recover from the immediate illness, the foundation of chronic disease of the kidneys may have been laid,—disease which may, perhaps, under the designation of one of its secondary results, prove ultimately fatal, or which may give a fatal tendency to some future illness fro

ich the little patient would otherwise be pected to recover,—so it may also be with kidney affection (similar in character) ich is associated with diarrhœa. Indeed, is not improbable that a previous attack diarrhœa may have been the origin of ny a case of chronic Bright's disease, ich, so far as the patient's medical his- y is concerned, has appeared inexplicable. To apitulate: Diarrhœa may be a salu- y process primarily, and secondarily an ment sufficiently serious to endanger life. e bowel, it must be remembered, is not y the medium of absorption of chyle and rishment, but as well the means of ridding economy of poisonous, effete, and excre- ntitious matters that, retained, prove detri- ntal and dangerous. Further, we must ept the doctrine that we are concerned re or less in the gastro-intestinal diseases nurslings, with (aside from the develop- nt of bacteria primarily dependent upon) ure of complete digestion, and conse- ently imperfect absorption.

When a mass of objectionable and indi- tible food is consumed, diarrhœa is evi- ce of Nature's attempt to repair the error.* is, too, is the common origin of diarrhœa ong infants, and also young animals of classes and grades, and is due chiefly to curding of milk and lack of power of digestive juices to act thereon; a hard, n, indigestible mass is formed, which no mach, unaided, can break down, and ich, passing through the intestine, irri- es and tempts inflammatory action; fur- r, we may have retention in part, with ultant fermentation and putrefaction. For s reason, and also from the fact that they tain an excess of starch, cow's milk and ented foods are objectionable as nourish- nt for infants, though, as far as the former concerned, the evil may in great measure mitigated by dilution with water and pep- ization. Morbid curding too often is the ult of bolting or hasty consumption of k, and one of the provoking causes of this infants is their being hurried, and threat- ed with removal of the breast when nursing, a common procedure with nurses and moth- who have household duties requiring at- tion.

* "An excess of casein in milk is justly feared for its ating influences, and an excess of fat works in the e way."—JACOBI.

(To be continued.)

THE LEGAL RELATIONS OF INSANITY AND CRIME.

BY J. FLETCHER HORNE, F.R.C.S.E., BARNSLEY, ENGLAND.

THE consideration of this subject was brought about by a crime committed by a medical man well known to me. His personal history was shortly this: Descended from a family who had already shown neurotic degeneracy in several of its members, he, as a medical student, was considered odd and peculiar in his manner, which was displayed in foolish and sometimes violent acts, and in a liking for mixing with company below his station in life, and at the same time showing an inclination to intemperance, which, in later life, developed into a confirmed habit. Married to a lady with whom he lived unhappily, the result of this union was two children, one of whom, a girl, he almost idolized. For some time before the evening of the day on which the crime was committed, he had been suffering from pleurisy, which had pulled him down considerably, both mentally and physically, while his eccentricity had increased. He had resumed his professional work, with his left chest full of fluid. After a quarrel with his wife, late at night, he got the child out of bed, as he said, to take to the pantomime, ordered his horse and trap, placed his wife and child in it, drove off, called at the first inn he reached, took them into a private room, and deliberately shot the child dead with a revolver, and then turned the weapon upon himself, the shot impinging a rib, the bullet burying itself in the intercostal muscles, and through the wound later a large empyema discharged itself. After a hard struggle, the patient, some months afterwards, became convalescent. He was tried at the following assizes, convicted of wilful murder, and sentenced to death. Only by the most strenuous efforts on the part of his lawyer and of members of his own profession, the sentence was respited to penal servitude for life.

Abhorrence is naturally awakened in the mind by certain offences, and there is no difficulty in seeing why members of the medical profession feel incensed when they discern, according to their light, a grievous disease punished by judges as heinous crimes. May we not be pardoned for feeling resentment under such circumstances? But our anger should not be hurled against our judges and lawyers, but against the law, which they do not make, but simply administer, and which they are

bound, however imperfect they may consider it, to accept, until the legislature is changed by the voice of the country. That the law requires to be changed, indirectly, by the efforts of the medical jurist, so far as regards the responsibility of disease, it will be our endeavor to show.

Let us turn to inquire what is the law of England with reference to insanity as an apology for crime, and to what extent is that law agreeable with the tenets of medical science. Every judgment given in cases in which the plea of insanity as an apology for crime has been set up since the year 1843 has been established on the answers given by the fifteen judges to the questions put to them by the House of Lords in the case of Mac-Naughton, tried for the murder of Mr. Drummond, who had been acquitted on Chief-Justice Tindal's directions, that the point for the jury to consider was whether, "at the time the act was committed, the accused had that competent use of his understanding, as that he knew that he was doing, by the very act itself, a wicked and a wrong thing." The general application of this theory would have greatly enlarged the area of irresponsibility, and its declaration produced considerable astonishment.

So far as the answers concern our present remarks, the kernel is summed up by the answers returned to Question II., as follows: "That to establish a defence on the ground of insanity, it must be clearly proved that at the time of committing the act the accused was laboring under such a defect of reason from disease of the mind as not to know the nature and quality of the act he was doing, or, if he did know it, that he did not know he was doing anything wrong." This statement has been far from effecting a final settlement of the question; but, in the mean time, it remains the chief exposition of the English law where insanity is pleaded as excuse for crime. If insanity is generally understood—*non compos mentis* as we may define it (we admit the difficulty)—as being a deviation from the normal mental state, characterized by a belief in something which has no existence, apart from the morbid imagination of the individual, may I not assume under this standard are included a large number of cases of insanity? Under it would pass the wild maniac and the idiot, whose comprehension does not realize the nature and quality of their actions, while the feeble in mind, who cannot see beforehand the consequences of his acts, and the delusionist, when these are of such a sort as would justify homicide, were they the doctrine held by a man perfectly sane. But it is obvious that this decision excludes a number of cases in contradistinction where legal irresponsibility exists, and it is defective in making the test of insanity on cognition or on intellectual condition, while it disregards conditions of the emotions and will, which are always more powerful on conduct than intellectual conditions, and which are always the greater number in insanity. Sir J. Crichton Browne (*Lancet*, No. 4, vol. ii., 1888) has also proved to us that attempts have been made to show that the statements of the law as laid down are not meant to be explanatory, but that it was so, he says, must be deduced from a study of authorities, and one of the highest of these, who had written lately on the subject,—Lord Bramwell,—has put the matter tersely thus: "The question, therefore, should be, not whether the person accused of a crime is mad, but whether he understood the law's threat. Whom ought the law to punish?" Lord Bramwell asks. "All who it threatens on conviction. Whom ought it to threaten on conviction? All who would be influenced by the threat, all whom it would or might deter or help to deter." The law as it stands, is, according to him, "right on demonstration," and he would unhesitatingly punish with enhanced severity, if need be, all insane persons committing crime, and capable of understanding the law's threat. The woman laboring under melancholia, believing herself doomed to die, and killing her child at the command of a supernatural voice, and the monomaniac, who, imagining that he has been robbed of his reputation, and assailed by electricity and mesmerism, kills one of his supposed persecutors, ought both, according to Lord Bramwell, to be executed.

It will be worth while to examine Lord Bramwell's position with some minuteness for it lies at the very core of our subject, and in doing so we would, in the first place, submit that he answers the very point at issue between members of the medical and legal professions when he takes for granted that in the morbid mind will-power is coextensive with knowledge. All who do not understand the law's threats he would exempt from punishment; all who do understand it, he would punish, because, in his view, all who thus understand have the power of refraining from the act for which punishment is threatened. Now, it will become apparent, as we go further with our subject, that this is not sound doctrine; that there are lunatics who

re as powerless to refrain from acts which ey well know will be followed by punish-ent as epileptics to refrain from fits which ey well know will place them in great opardy.

But, in the mean time, we venture to criti-se Lord Bramwell's whole theory of punish-ent, which appears to us of too narrow its. What is the true theory of punish-ent? Why do we inflict pains and penal-s upon those who do wrong? Simply, would reply, to deter others from falling to similar evil courses. The power of de-rrence is, in his estimation, the sole motive derlying punishment. The reformation of e criminal he would, perhaps, regard as a condary consideration, which, following the eory, ought to be classed under deterrence, to reform a criminal is simply to deter n by punishment from repeating his of-nces. But this deterrent theory of punish-ent has never satisfied mankind. If it were gitimately carried out it might lead to pun-ments of impressive severity, perhaps to rture, or to a similar conclusion, as realized the "Laws of Dracon," which made death e punishment of every crime; or, on the her hand, to the abandonment of punish-ent altogether whenever it failed in avert-g crime; or, still again, to the punishment persons known to be innocent, for the sake example, when a great crime had been per-trated or when crime was prevalent. The t is, that it is impossible to eliminate from r penal institution an element of moral probation. There is in us an organic co-ion between the idea of transgression and e idea of penalty, an intuitive belief in a *vis dicatrix naturæ*, which metes out punish-ent to law-breakers, redress of grievances, adjusts a balance that has been disturbed, d subserves the criminal under that law force which he has himself asserted. When child burns its fingers by placing them in e flame of a candle, the sharp pain experi-ced deters from a repetition of the experi-ent, but it would be a very special teleology at would maintain that the whole object of mbustion was deterrence from burning; d so, I think, it is but a narrow philosophy at recognizes in punishment nothing deeper d under than a practical significance. anting, for the sake of argument, that the eory before referred to is correct, then we intain that Lord Bramwell makes several umptions in his application of it to luna-that cannot, I think, be justified. "Pun-he says, "all whom the threat of pun-ishment might or would deter; and punish madmen," he goes on, "because they are deterred by the threat of punishment, not, perhaps, as often as sane people, but still sufficiently often to make it worth while to punish them. The answer to this seems to us to be that by punishing madmen one cannot hope in any appreciable degree to increase the deterrent influences which al-ready operate upon them. Not one lunatic in twenty realizes that he is insane, and thus the vast majority of lunatics are already de-terred from crime by the fear of punishment, as much as it is possible for them to be." The medical profession differ from Lord Bramwell in his application of the principle he propounds. We are prepared to admit that amenability to threats is in a sense the true test of responsibility, but we cannot allow that the understanding of the threat is any criterion of amenability to it, or that the boundaries of responsibility, as dictated by Lord Bramwell, correspond with those which professional experience delineates. The lunatic who can respect a threat has a free will, while the lunatic upon whom a threat has no influence is under the thral-dom of disease. That is the real practical question at issue in every case in which the defence of insanity is set up. Was the luna-tic free to choose or under the duress of disease? Was his will capable or inept? But Lord Bramwell, and those who think with him, argue that it is sufficiently proved that the lunatic could help it, if he knew the nature of his act,—viz., that it was kill-ing; the quality of his act,—viz., that it was a crime, and also it was wrong in the sense of being forbidden by law. Whereas, medi-cal men, almost without exception, maintain that a lunatic may be able to know and ex-press the nature and quality of an act and its wrongness, and at the same time be as unable to resist doing it as, for instance, to abstain from jumping under a smart electric shock. The knowledge of the nature and quality of an act and its wrongness is not, in the regions of pathology, any measure of will-power; and not only medical men but judges have per-ceived this.

The late Lord Chief-Justice Cockburn, one of the greatest authorities of his time, said, "The power of self-control, when destroyed or suspended by mental disease, becomes, I think, an essential element in the question of responsibility." And Mr. Justice Stephens has expressed the opinion that the law of England ought to require no act to be a

crime, "if the person committing such crime be, at the time of commission, prevented, by defective mental power or by any disease afflicting his mind, from controlling his own conduct, unless the absence of the power of self-control has been produced by his own default."

It needs no apology from us for quoting at length such weighty words from our former teacher, one who has attained the foremost rank as a psychologist. It is satisfactory to see so sound a lawyer as Mr. Clark Bell (president of the Medico-Legal Society of New York) so vigorously combat Lord Bramwell's dogmatic utterances, "because the insane in asylums can be influenced by threats in the control of their conduct, they are under the law's threats, and therefore responsible," as follows: "I concede that they are constantly so influenced; but where does this lead to? Not necessarily to responsibility. Would Baron Bramwell say that, under the law of England, an incurable lunatic, an inmate of an asylum, should be hung for the homicide of a keeper, physician, or even another inmate? Has such a thing happened? Can it occur again? Yet the law threatens him, he knows right from wrong, and knows he is doing wrong, and he is influenced by and is under the threat of the law, if Baron Bramwell's theory is correct. It is a question of degree, this power of the will. A homicidal or suicidal lunatic, threatened with a strait-jacket by his keeper, or with hyoscyamus by a physician, might be able to abstain from a given line of forbidden conduct in an asylum, and yet be wholly unable to resist killing another in the one case, or himself in the other, if the watch upon him was intermitted an instant. The ability to comprehend the law's threat must be considered in connection with, and in relation to, the will-power of the lunatic to resist or overcome the impulse or delusion. Does the delusion dominate the will? could he help it? should be the question. The loss of mental inhibitory power, or loss of self-control, may be momentary in duration or it may be constant. Most persons are visited occasionally by odd thoughts. How many of us are duller in the morning and more lively in the evening, or who are duller in the winter than summer, or the reverse, or who are more irritable at stated intervals, or who are subject at divers times to 'moods, tempers, and fancies?' Are there not hundreds of people whose mental life is one long interchange of impulse, or its reaction, activity, and dulness, by a natural law of their structure? We must always regard human action as the outcome of action within the body, stimulated by present surroundings, or by those that acted upon the individual's ancestors. They present to us the fascinating picture we see shown to us in the working of a steam-engine. How its initial movement, so weak at its commencement, amplifies and increases continually, in proportion as the volume and power of the mechanical appliances placed at its disposal become more considerable and more powerful."

Damasippus and Horace held that all men are mad,—*insanus et tu, stultique prope omnes*. Dr. Ball, without going quite so far as this, states "that the number of persons perfectly stable on all points throughout the entire period of their existence form but a minority of mankind." "The world abounds with people," he tells us, "whom a strict scientific diagnosis would condemn as mad or more or less touched," yet at no time in their life would it be permissible to put them under restraint. Such people are to be seen occupying, honorably and successfully, every position in life and society. We brush against them when we take our walks abroad, we see them in the mirror which reflects ourselves. On the other hand, insane tendencies are often hidden with great skill, and are for a time consistent with great intelligence, while the ordinary duties of life are discharged in a way which does not excite mistrust, yet the accompanying state of mind and the final sequence of mental disorder do not fail eventually to produce conditions leading to disclosure. Men holding exalted positions subject of overwhelming impulses of a congenate sort, have discharged their duties for lengthened periods, while conscious of an almost overpowering influence. The recognition in lucid intervals of these impulses and delusions fills the patient with horror and remorse, and often forces an avowal to the patient's physician or friend. Dr. Forbes Winslow says, "Homicidal lunatics are cunning, deceptive, plausible, and, on the surface, to all outward appearances, sane; but there is contained within their innermost nature a lurking after blood, which, though at times latent, will develop when the opportunity arises. This impairment of the will is, as a general rule, found in those predisposed hereditarily to the neuroses, or in those whose brain-functions have been damaged by an injury to the head, perhaps slight

neglected at the time, by overindulgence in alcohol or other excesses. They are always present, in greater or less quantity, in insanity. In every case the higher centres are involved; there is enfeebleness of their functions, the lower centres become more excitable whenever the centres of volitional inhibition are weakened, or whenever their influence is temporarily in abeyance; the centres beneath them respond excessively to peripheral impressions, and, when the power of the brain is upset, we have to deplore the loss of self-control, and we have overactivity expressed by delusions and extravagant actions. Are not the first signs of insanity often but the outward expression of features of thought and feeling, which, in normal health, is held *in laissi*, but which break loose, owing to loss of inhibition. No better illustration of sudden and complete overthrow of will-power could be advanced than the far Eastern Malay we read about in the newspapers a few months ago, who, having received a shock from the death of his daughter, sprung to his feet, started off, and stabbed the first eleven people whom he met in the street with his knife.

We do not say that all criminal acts are to be looked upon as mere brain defects. One means of preventing the terrible tragedies which ever and anon startle our domestic lives, is to endeavor to find out in early life the make, constitution, and tendencies of children, especially those whose inherited conditions or brain state, as induced by circumstances, are exceptionally difficult to control: we should take care, as they grow up, not to place them in positions for which they are obviously unfit, nor must we forget that much can be done, by training and discipline, to correct defects and improve conduct and character, nor that exceptional criminals, like geniuses of high talent, are bred by inheritance, training, and social surroundings. The children of those fallen in crime grow up surrounded by an utter absence of virtue, and all their bad tendencies are accentuated by the absence of the conditions of wholesome life.

Clouston says, "In relation to the medico-psychological problems of mental inhibition and impulse, we have to take into account those obscure human tendencies towards killing, towards destructiveness, towards appropriation, towards unrule, some of which exist as incognate psychological tendencies more or less strong in most human beings, and the ratifying of which gives pleasure. They are best seen in youth, and they often come out in disease. Be they transmitted qualities of our far-off progenitors, or physiological weapons to help us in the struggle for existence, or other or normal physiological energies transmitted, there they are, and we must accept them as facts of nature. The forms of insanity in which crime is usually committed are mania, epileptic, impulsive, and alcoholic insanity, and generally, like suicides, in the incipient stage."

Maudsley and others have written of cases of impulsive insanity in which murder was the common tendency; but, as a rule, in these there was a special antipathy, the insane correlative of love,—the tendency of the loving husband to kill his wife, or the doting mother to destroy her offspring. There are many intricate cases on the border-land of disease,—cases of mild enfeeblement of mind, the voluntary taking of drink, where we have crime committed in delirium or short frenzy. In forming an opinion in these cases, we must weigh the circumstances of the case carefully, in the spirit of the words of Lord Hale, lest, on the one side, there be a kind of inhumanity towards the defects of human nature, or, on the other side, too great an indulgence given to great crimes, avoiding always, in the interest of science, becoming a partisan. The case at the heading of my paper is but a typical one. He had no known insane delusions, he could reason well, he was ever affectionate, doting on his darling child, he was the reverse of cruel, he had no motive for killing his child, he managed to carry on his professional work in a country practice, and yet he kills his child by a shot from a small revolver he had habitually in his pocket, and then, in a moment of remorse—and it is not denied that the subjects of insanity feel this—attempts his own life.

Let us ask ourselves, Are not these conditions connected with an original hereditary tendency to mental disease, as shown by other members of his family? From his youth upward he has been odd and eccentric. In middle life, shown by extraordinary acts and conduct, false views concerning those nearest and dearest to him, as shown by a letter to his wife, written on the day of the crime. Is this condition not associated with a brain injured by constant indulgence in alcohol, and exhausted by the running down of his vital power by the disease from which he was still suffering? What room is there to doubt that the man at the moment he shot his child was in a state of

defective inhibition, manifested not by delusions and similar symptoms, but by an act of violence, driven by blind, uncontrollable, and morbid impulse, whereby the will and the reason were for the moment overpowered. Is it not a fact that the impulse may be satisfied and exploded by the act? It may be as sudden as an epileptic fit, and may, like the latter, bring relief to the brain. Indeed, there is a strong connection, as well as analogy, between the two disorders; and, as Dr. Maudsley says, "instead of a convulsive movement, there is a convulsive idea." The doctrine of ungovernable homicidal impulse has been used to cloak real murderers. Of this there is little doubt. But our duty as medical jurists is not only to consider the act itself and the manner of its performance, but we must also closely sift the past history of the perpetrator and his progenitors,—to carefully weigh the evidence in every case, and to look diligently for other causes or symptoms of nervous and mental disease with which it may be associated. Let us always keep in mind that a morbid neurosis is not the less certainly hereditary because it shows itself under different forms in different generations. One generation may exhibit epilepsy or alcoholism, while the next displays well-developed insanity, while it will be generally found that the near relatives of the insane exhibit varying degrees of nervous instability.

One of our judges (Sir J. F. Stephens) puts it, "That generally medical men can only say that A did in fact labor under a particular disease, with the nature of which they are very imperfectly acquainted, but how that disease may have been related to any particular action of A's, in most instances, they cannot tell at all." While another judge ruled "that the question of a prisoner's insanity was one for the jury, and not for the medical witnesses."

It cannot be denied that there was a time when the functions of the brain were unknown, when insanity was elucidated by metaphysics, and then, perhaps, a case of insanity might have been as well determined by a jury of tradesmen as by physicians of a century ago. But, thanks to Ferrier, Bastian, and Jackson, herein has been worked a change, the limit of which has not yet been reached. Already a ray of light has broken in upon the legal minds of our judges in America. Judge Montgomery, of the District of Columbia, in charging a jury, said that if a prisoner, who was indicted for murder, "was mentally afflicted, so that he did not know right from wrong, as applied to the act, or, if he did know, but by reason of the duress, the stress of his mental disease (if he had any), he had no power to choose, no power to avoid doing what he did, and if the homicide was the product of his mental condition solely, or if by reason of the insane delusions which he had been harboring (if any) he had reached that condition of mind where the morbid impulse to kill became irresistible, and existed in such violence as to subjugate his intellect, control his will, and render it impossible for him to do otherwise than to yield and do as he did, then he was not to be held accountable."

Judge Somerville, of Alabama, has departed from the beaten track by questioning whether there may not be "an insane person who, while capable of perceiving the difference between right and wrong, is, as a matter of fact, so far under the duress of a diseased brain that the power to choose between right and wrong is destroyed, and that in such a case, although he perceived a difference, was not criminally responsible for an act done under the influence of such controlling disease."

Since the above was written an important legal decision has been given by Baron Pollock, who has the reputation of being the most humane judge on the bench. At the Leeds autumn assizes, December 14, 1888, G. M., aged 34, was indicted for the wilful murder of his mother on October 11, 1888. The crime was remarkable in several ways. There was the relationship between the prisoner and the deceased woman, and then there was the fact that the whole of the crime was witnessed by a domestic servant in her employ. The prisoner lived with his mother at a village inn. After the closing of the house at night, he came into his mother's sitting-room about eleven o'clock and locked the door, putting the key in his pocket. The mother and servant ultimately lay down on the sofa, each taking an end. The accused then went to a cupboard and took out a pistol, which he proceeded to load with powder and shot. Until about half-past seven the following morning he held the pistol in his right hand. That fact afforded a reason why the servant was unable to raise an alarm, the prisoner threatening to shoot her if she made a noise. He became very wild and excited, pulled his mother off the sofa, demanded and obtained what money she had, and threw her on the floor. He then commenced kicking her, and for four hours continued to d

so. After she was dead he still continued kicking her. He then tore the whole of the clothing off the body, protesting all the time that it was not his mother. Witnesses were called to prove that, up to the afternoon of the day of the murder, prisoner appeared to be in his proper state of mind. When arrested and charged, he said, "This has all been brought about through being too fond of money lately; but I did not think she was my mother." He had been engaged to be married, and his mother had been opposed to the match. During the last twelve months he had been very nervous and excited after drinking, and had fancied that there were persons in the house when there was nobody there. Five years ago prisoner was attended by the family doctor for delirium tremens, and who gave evidence that the mother was a nervous and timid woman, of feeble intellect, and suffered from general depression, and was under the impression that some one was always watching the house; while an uncle of the prisoner committed suicide while in a temporary state of insanity, and that his aunt was confined in a lunatic asylum. A month after the murder, the accused was examined by a specialist, at the request of the treasury, and who gave evidence that the prisoner was suffering from *mania à potu* with homicidal delusions. His lordship, in charging the jury, pointed out, according to the law of England, which has been laid down for centuries, that no man can reduce himself to the condition of a brute beast, and then claim exemption from the ordinary laws of the land, or the duties he owes to his fellow-creatures, by saying, "I did this act, but at the time I did it I was in a state of absolute want of reason, produced by drinking." So, if this case rested on this point, there would be no defence whatever; but it is admitted that, on the 16th October his mind and body were not like those of other men. It may have been that the great portion of the infirmity from which he suffered was occasioned by hereditary influences transmitted to him by those who had gone before him. Therefore I say that this man's infirmity, his deterioration of mind, arose from that cause to a very great extent, and it may be that his infirmity and deterioration of mind in itself might have accounted, and possibly did account, for the crime which he committed on the occasion when he killed his mother. If so, then, of course, there steps in another rule of law, which is but the common humanity of the laws of all nations, "that no man should be held liable in a criminal court for conduct however wicked, wrong, or contrary to morality or the laws of his country, when it is done by a person who is not in possession of his right mind, and whose mind cannot govern him as to what is right and what is wrong." The strongest forms of all the sorts of insanity which is excused by the law is the insanity which, beyond all doubt, establishes that in the mind of the man who commits a crime there is a delusion. Another question arises in the case. It is said, "Here is a man who, it is granted, has some tendency not merely to insanity, but to insanity of a peculiar form, known as homicidal mania, which is identical with suicidal mania; that such persons have impulses under which they lose control of themselves, and therefore they are not responsible to the law. It is said that this man never would have done this act if he had been a temperate and careful man, and that, had he abstained from alcoholic drinks, he might have gone on living at peace with his neighbors for years. He might. But then he takes a certain amount of alcohol, and that, added to his predisposing condition, makes him a man who commits murder. It may be said that, if a man has an infirmity which prevents his taking alcoholic liquor, the rules against an ordinary man taking liquor are more applicable to him, because he ought not to take a little drop if it upsets his reason. We get here rather a fine question. In the first place, it may be a sound, moral argument that a man should know his own condition, and that he may be told it beforehand; but, as we have often heard in courts of justice, the last man to know his own infirmity is the wretched creature himself who is the subject of this infirmity,—the infirmity of a weak mind. He cannot argue as doctors argue for him. He goes about the world believing that he is on a level with other people who are around him. Therefore I should have no hesitation in telling you that if you think the evidence in this case points to this, that although the man had been more or less of a drunkard for the last two or three years, and had delirium tremens, if at the time he committed this act he had not made himself drunk by an excess of liquor, but had taken that amount which an ordinary man might take without injuring himself, but that the real cause of this terrible event was his brain being upset by a predisposing cause,—although a contributory cause was the taking of this small amount of liquor,—I should then direct you that it would be your duty to

say that he is guilty of the crime in fact, but that he is excused from the effect of that crime by reason of his insanity at the time." The jury agreed that at the time of the commission of this offence charged the prisoner was insane. It would almost seem that his lordship early in his charge had abandoned the existing legal test,—the knowledge of right and wrong,—but later returned to it. The greater or less amount of drink taken by the prisoner before the committal of the crime, as bearing on the question of responsibility, is a matter, perhaps, opening the way to innumerable difficulties.

Again, in a later case, Regina *vs.* Hey, Baron Pollock said, "Every person is responsible for the consequences of his own act. If, however, he has no knowledge of what is right or wrong, or afflicted with insanity, he may be guilty of the act, but not guilty to the law as if he were a sane man." It behooves us, therefore, to use all our endeavors to persuade the legal mind of the necessity of reform in this important matter, and thus to compel the legislature to substitute proved scientific data for the existing legal test of criminal responsibility,—"the knowledge of right and wrong, or the nature and consequences of a criminal act," the so-called "common sense" test of insanity, as adopted by Lord Bramwell and others,—and to point out the necessity of appointing expert psychologists as assistants to the judges, whose duty would include the examination of the accused as soon after the crime as possible, as a step in the right direction, to set at rest a subject full of interest to every citizen, pregnant with the rights and destiny of the insane, and to put an end to the contests in courts of law on questions of responsibility and disease, as now determined by the provisions of many of the forty legal enactments relating to the insane which find a place in the statute-book of our country.

AN OBSCURE DISEASE.

By John A. Lanigan, M.D., Hyde Park, Mass.

WHETHER that which I am about to describe ought to be considered a disease in itself, or merely a symptom of a disease latent in the system of certain individuals, I am not prepared to say, but I certainly cannot avoid noticing the fact that this state is so predominant as to obscure any or all other symptoms, if, indeed, such exist. The state which I refer to is what may be called the inebriation of sudden joy. It will be seen, however, hereafter, that this inebriation may arise from other causes than joy; anger, for instance, may bring about the same result.

If my readers will kindly allow me to speculate a little, I will venture the suggestion that the seat of such disorder may be situated in the spleen, but, as the function of the spleen is not as yet known, this opinion must of necessity be only presumptive and somewhat hazardous.

It would be well, however, before going any further into the subject, to state exactly what I mean by the inebriation of sudden joy. Well, briefly, I will say that I have known and read of many persons who have been thrown into a stupid state of intoxication from sudden joy or anger. That is to say, the joy was the *apparent* cause; but it may have been merely the exciting cause that awakened some deep-seated and obscure malady. However, although I have studied the subject for years, I am not yet in a position to speak with certainty.

I will here recount some of the many instances of this disease that I have read of, and afterwards I will describe the instances that have come under my personal observation.

A prominent military man, who had drunk moderately during the war, and had abstained from that time on, while attending a dinner (some twenty years afterwards) with some of his old comrades, suddenly became hilarious, made a foolish speech, and settled back in his chair in a drunken state, and was finally taken home quite stupid. He had not drunk any spirits, and had only used coffee and water, and yet he had all the symptoms of alcoholic intoxication. His case, it is believed, was due to a contagion (malaria) which he had contracted long ago, when in the army.

Another case was that of a man who had been an inebriate years ago, but had reformed, says the *Popular Science Monthly*. He was recently elected to office, and gave a dinner to some friends. Among them was a physician who has been greatly interested in these studies. He sent me a long report, the substance of which was this: On the occasion referred to many of the company became partially intoxicated, and the host, who drank nothing but water, became hilarious, and finally stupid, with them. He was put to bed with every sign of intoxication, but recovered, and next morning had only a confused notion of these events.

The third case occurred four years ago. A reformed man, of twelve years' sobriety, went on a military excursion with a drinking company, and, although he drank nothing but lemonade, became as much intoxicated as the others. This event was the subject of much comment and loss to him, socially and otherwise, although he protested, and others confirmed his statements, that he did not take any spirits at this time.

So much for some of the cases that I have read of; now with regard to those I have personally known.

A certain lady who had never taken more than an occasional glass of wine, and that very rarely, about six weeks after confinement invited a number of guests to the "christening." Although wine was partaken of by many of those present, the lady in question refrained from so doing, but became after a while "exceedingly jolly," talked at random about many things decidedly irrelevant, and at last went (or was brought) upstairs in a stupid condition and put to bed. The lady was sick for several days after, during which time she appeared exceedingly nervous, and her mind seemed or was in a confused state. This case puzzled me not a little to diagnose, and, although I had my suspicions that there was some underlying malady, I put it down as a bilious attack. The lady's eyes had all the appearance of one who is recovering from a spree, and, indeed, if I had not known positively all the circumstances, I might have been led into that error.

Another case is that of a gentleman who seldom, if ever, tasted liquor. His salary had been, on account of his abilities, suddenly raised one thousand dollars a year. As soon as he received the news he came to my office in an overjoyous state, his eyes fairly "dancing" in his head, to inform me of his good luck. We conversed a while over the subject, and suddenly he arose and went back to his place of business to complete some correspondence that he had left unfinished. About half an hour after I was called suddenly to attend him. I found him unconscious or stupid, and could get nothing out of him. I was informed by the other clerks that he came in and sat down to work in his accustomed manner, when suddenly one of them noticed he was fast asleep and could not be aroused; his face was pale, and they became alarmed and sent for me. The gentleman had taken no liquor, and yet he exhibited the manifestations of one who had been on a spree. At one time he would be very despondent, and say he knew he would be discharged; at another he would attempt to sing. Again, he would start to praying, and insisted he was dying, and wanted his clergyman sent for immediately. In about a week he was all right again and at work enjoying his augmented salary.

I could enumerate over twenty similar cases, if time and space would permit; but I think I have said enough to prove that there may be other sources of intoxication besides alcoholic stimulation.

In the many instances of this disease which it has been my fortune to witness, I have noticed the following train of conditions in the individual, which, I can most positively affirm, are similar in each succeeding attack, and almost identical in every separate case.

The first stage is preceded by a period of despondency or depression of spirits, of longer or shorter duration, at which time the mind becomes more than ordinarily acute; then, under the stimulus of some excitement,—joy, or, in some instances, anger,—the individual becomes somewhat hilarious or excited (according to the immediate cause), says and does silly things, and eventually becomes totally unconscious, from which state he awakes tremulous and nervous, and entirely ignorant of what has transpired from a certain time, but *perfectly* cognizant of every turn, look, act, and word, even, that he may have said or done previous to that time. I dwell upon this point because I look upon it as somewhat diagnostic. That a man should be able to give a strict and detailed account of all his words and actions, and even many of his thoughts, together with a full record of his conversations with other individuals, in almost the exact words, and then suddenly all to become a dead blank to him in a few minutes, indicates a state of the system little, as yet, understood.

After this period is what might be called the second stage of the disease. There is, as a rule, a loathing of food, owing, perhaps, to a disordered stomach, for the brain and stomach are so sympathetic with the diseases of each other that one cannot be affected in any marked degree without likewise affecting the other. Then there is a period of depression of spirits, alternating with drowsiness, which, in its turn, is succeeded by flashes of brilliancy of mind, during which time the patient appears to be all right, only a little *nervous*.

The third stage is a period of wakefulness, during which time the patient is *exceedingly*

nervous and imaginative, hates to be alone, during the night especially. Perfectly sane, however, on all ordinary topics; quiet but restless. Here the attack generally ends by restoration to health, if properly treated and *cared for;* otherwise, in this state, the patient is sometimes, though a good-living man, liable to commit suicide or other rash act.

Now, such is a complete description of the character of the disease (call it what we may), as it has manifested itself in the numerous instances that have come under my observation. And although many of those symptoms are common to inebriates, still I am only speaking here of individuals who have either taken no liquor at all, or have taken so little as not to be worthy of the slightest consideration.

Now, the question arises, Can the sudden change from one state of the mind to another be capable of producing such a chain of events without the individual being in any other way diseased, or must there necessarily be some pre-existing malady in some one of the organs of the body? One thing more I would say, and that is, that the liver appears to be in a torpid condition in some instances and not so in others.

HYSTERO-EPILEPSY IN THE MALE.

By Cheves Berill, M.D., Winfield, Ark.

IN the summer of 1882 I attended a patient that gave me a great deal of trouble, owing to his peculiar condition. Such a thing as hystero-epilepsy at that time, so far as I know, was not well recognized, and this patient manifested symptoms identical to females whom I had treated for that perplexing disorder of the nervous system. Hence I here give the notes of the case as then taken, and if it was not a well-marked case of hystero-epilepsy, I will find it out later on, after the profession has read the report of this case.

H. H., aged 22; of German descent; heavy set; weight, one hundred and sixty to one hundred and sixty-five; fair complexion; blue eyes; auburn hair; appetite good; bowels and kidneys acting well; no predisposing cause for disease.

July 30, 1882.—I was sent for to see him, but, being away, another physician, of considerable experience, was taken down to see him. I saw the physician next day, and he told me that the patient had "had a congestive chill," and that he put him upon quinine in large doses, and that he thought he would get over it all right.

July 31.—I was again sent for. It was about 11 A.M. when I arrived where he was. I found him in a strange condition. He was restless, tossing from side to side. Pulse, 140; respiration, 30 to 35; face flushed; pupils dilated; tongue coated some little. Owing to the somewhat difficult breathing, I employed amyl of nitrite, enough to flush the face considerably. I gave cathartic medicine, as the bowels were costive. After two hours he was resting quietly, breathing freely, and pulse 100. I was puzzled over the case, as I had often treated every form of congestive fever, and always saw high fever following the chill. I left more quinine, to be given during the night.

August 1.—Saw him at 9 A.M. The medicine had moved the bowels freely. Pulse, 80; respiration, 20; had eaten some breakfast; talked as usual; said he was well. But at 12 M., while we were eating dinner, all at once he became speechless, and spine stiffened, hands clinched together, and toes drawn down; legs flexed somewhat; breathing irregular; pulse accelerated. He would whirl over on his side as quick as I ever saw any one and bury his face in the pillow, so we had to pull him over to let him breathe. The pupils were slightly contracted for a while, then widely dilated. The eyelids would open and shut for a while, then they closed, and remained so for some time. The teeth were firmly set, after having been ground together for twenty minutes; the skin felt natural; abdominal muscles tense; head soon began to draw back; spine to curve; then to turn his body from right to left, his feet resting on the bed; some froth came out of the mouth. This state continued for over an hour, and he got quiet, but seemed to be very weary after the contortion. After he got perfectly quiet, I wet my hand in cold water and suddenly applied it to his throat. This caused considerable trouble. He whirled from side to side, and looked at me in a wild manner; pupils widely dilated; fingers again clinched down in the palm of the hand. This passed off in ten or fifteen minutes, and he went to sleep, and slept a short time. By 4 P.M. he was rational, and would talk when spoken to. I was now more in doubt as to what the trouble was than ever. I could not for my life locate the disease. Hydrophobia seemed to me to be the most probable of any disturb-

ance that I knew of. The spasms caused by the wetting of his throat made me have some fears that this was the trouble. I now began to give bromide of potassium in 15-grain doses every six hours. I saw that quinine was of no use. He passed urine freely and in large quantities. He was somewhat reticent during the night, as I was told.

August 2.—I went back to see him early. He seemed cheerful enough. The eyes looked a little wild, tongue clean, respirations about normal, pulse 75 (am sorry that I had no thermometer at that time to keep the temperature). He now could drink water without any difficulty; had some appetite. I thought I had him upon safe grounds, but concluded to stay until evening. I kept close watch over him all the time, to see if I could detect anything of importance. At 11.30 he was again seized with another paroxysm, as on the previous day, only it was more marked in severity, if possible. He this time bit his tongue and lips, hiding his face in the pillow as before. Once the pupils became dilated. The contortions of the body were more violent, head drawn back, heels on the bed when on his back, face flushed somewhat. Pulse, 130; respiration, 35 to 40, deep at times. He groaned and made a growling noise, and tried to bite those of us who were near him, and even his own hands; later, though, the limbs became as before, and, in order to keep him still, it took four strong men, each to a limb. I now used chloroform to quiet him, which promptly did so. After he was from under the influence of the drug, I again dropped water upon him. This caused some little disturbance. He was now very hyperæsthetic; could not endure to be touched without causing some disturbance. He went to sleep, and slept for an hour; on awaking he seemed somewhat delirious, but all this soon passed off, and by 4 P.M. was rational as ever. I now gave the bromide in the same-sized doses every four hours for twelve hours, to try and keep off another such state of affairs: but at 11 P.M. there was another paroxysm. I used the chloroform in the earlier stage of the attack. While I was applying it he caught the handkerchief between his teeth, and threw his head from one side to the other so rapidly that the corners would fairly flap, and he would growl like a dog, gritting his teeth; then he drew his head back, and it took four of us to hold him. I now used the chloroform more freely, which soon quieted him again. He slept for a while, say an hour, and awoke, as before, a little wild. This state of things continued on, in spite of everything that I could do for him, for fifteen days and nights. I had good counsel, but it did no good, as some thought there was but little wrong with him. Some would say one thing and some another; some would have it epilepsy, others hydrophobia, and—to beat all—one old faith-doctor (a woman) came to see him and pronounced him "bewitched." The paroxysms grew lighter. While the lighter spell would be upon him he would keep scratching his penis and scrotum, which was getting somewhat irritated. A deep-colored rash came out on the body from the bromide. There was nothing wrong about his genitalia, as far as I could tell. Later on he would take one of these spells, and try to tear the bedclothing to pieces, and hence had to be held. After a while he would lie down when they began to come on. I was now giving him bromide at the rate of 120 grains during twenty-four hours. The bowels were regular, kidneys acting too free. The urine was clouded somewhat, with considerable albumen in it. By September he was able to go to work again. He finally got well, and went off to his home in Illinois, and has had some little trouble twice since. I could not tell what was the trouble, neither could I locate it, until I saw that Professor Charcot had seen cases of "hystero-epilepsy" in the male. Of course, I may be wrong in my conclusions, but will hold to it until shown different by some neurologist. I would like to hear from some other physician, if he has had such a case.

SANTONINOXIM.

COPPOLA advances the theory (*Repert. de Pharm.*) that the unfavorable symptoms which sometimes follow the administration of santonin arise from an intestinal catarrh produced by the worm, in which there is an exaggerated formation of lactic acid that favors the solution and consequent absorption of the santonin. He recommends, therefore, the substitution of santoninoxim, a crystalline substance that is less absorbable and nontoxic, and which he has found to be equally active when administered in double or triple doses. This santoninoxim is a compound obtained through the action of hydroxylamine upon santonin in an alkaline liquid.—*Druggists' Circular*, August, 1889.

The Therapeutic Gazette

EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

PREVENTION AND CURE OF POSTERIOR DISPLACEMENTS OF THE UTERUS DURING THE PUERPERIUM.

THE practical results of modern midwifery are as apparent as they are substantial. Given the control of all the conditions in the concrete case of labor, and the accoucheur no longer has cause to fear infection of the genital tract. Infection of the nipples and mammary abscess are likewise preventable disorders, while ophthalmia of the new-born merely implies neglect of Credé's methods of prophylaxis.

It is true that women continue to die of child-bed fever and to become lifelong invalids from septic infection of the pelvic peritoneum and connective tissue. Fissured nipples and gathered breasts are by no means uncommon, and sore-eyed babies crowd our dispensaries. These painful facts, however, do not invalidate the universal application of the proposition that the diseases named are now examples of sins of omission or of commission upon the part of attendants or patient. For they find adequate explanation upon the one hand in the equally painful fact that the doctrine of obstetrical antisepsis has not yet passed into the *succum et sanguinem* of every practitioner and nurse in the land. Upon the other hand, the parturient woman herself is often at fault, although seldom in equal degree. At the same time that she may be densely ignorant and superstitious, she may also be very poor. Unhappily, in her case, there applies the principle, *point d'argent, point de Suisse.* Accordingly, it is Utopian to plan the absolute stamping out of puerperal disease, so long as it is impossible to eliminate these potential factors. So far as concerns the control of the two conditions mentioned, we live not in "the republic of Plato, but in the dregs of Romulus."

These splendid achievements are cause for congratulation, while at the same time they give assurance of the coming of more of like kind. For the practice of midwifery is still imperfect. There remain failures of nature and errors of art that, on the one hand, must be supplied, on the other prevented or modified. It is the purpose of this note to discuss briefly one of these *opprobia* of our art, posterior displacements of the uterus during the lying-in period.

Retroversion and retroflexion are occasionally observed in unmarried or sterile women, commonly as the expression of congenital vice, acquired disease, as metritis, new growths, and the like, or as the result of violence. As a rule, however, such displacements are found in women that have conceived, and date from some one of their miscarriages or confinements.

The time when these displacements are determined, according to our observation, is not after the puerperium, but during the normal period of involution,—that is, during the six or eight weeks following the evacuation of the uterus. In the majority of cases the change in position is manifest as early as the fourteenth day. The later limit is indeterminate for obvious reasons. However, in the cases under our observation, no primary posterior displacement has occurred after the expiration of the eighth week of a normal puerperium. But it is evident that secondary changes of position, due to impairment of the integrity of the pelvic floor, violence, and the like, may take place at a still later period.

Posterior displacements during the period of involution are, as a rule, original and not secondary changes in position. Emmet has pointed out the distinction between "original" and "secondary" versions; the former

class includes displacements, due chiefly to conditions inherent in the uterus itself; the latter, those due chiefly to conditions of the neighboring parts. The immediate causation of these displacements varies within wide limits. In the first line, it is necessary to mention the predisposition conferred by the presence of the anomaly before conception. Although pregnancy can be used to effect the cure of many posterior displacements, as pointed out by Pajot and others, yet no one will gainsay this proposition. The force of gravity is operative, especially when the woman lies flat on her back, with the enlarged, top-heavy womb in unstable equilibrium. This factor is of import, especially during the second week, when the uterus, weighing more than three-quarters of a pound, is still small enough to pass below the sacral promontory. Atony of the uterine musculature, round and retro-uterine ligaments, plays a significant *rôle*, since it passively aids the operation of gravity by causing the uterus to assume and persist in a semi-cadaveric position. The true cadaveric position of the post-partum uterus, as shown in Schroeder's plane frozen section, is one of retroflexion, the corpus reclining upon the lumbar vertebræ, while the recto-uterine *cul-de-sac* is free from intestines.

Goodell is of the opinion that stasis of blood in the posterior uterine wall—the consequence of inadequate retraction—is a very common cause of posterior displacements. The distended bladder tends to tilt the fundus backward, while the rectum stuffed with fæces pushes the cervix forward towards the symphysis. Retention of urine and constipation are conditions that are almost always present even in normal puerperæ. The obstetrical binder and uterine compress is once in a while productive of harm, although its omnipotent influence for evil, insisted upon particularly by Thomas, is an exaggeration. As commonly used, like a loose surcingle, the binder is without effect for good or ill. When tight enough to constrict the abdomen, especially when applied over a compress, its causal moment is not inconsiderable. Finally, there remain numerous accidental factors that may determine the displacement. Many of these accidental factors act through sudden variations of intra-abdominal tension.

Very much can be accomplished in the prevention of backward displacements during the puerperium; still more in their permanent reduction. The prophylaxis consists in the elimination of the causal factors, already mentioned, when possible, or in their favorable modification, when their operation cannot be rendered null. The first and most important step is to secure and maintain normal retraction of the uterine musculature after labor and during the early days of the lying-in period. The fulfilment of this indication implies proper conduct of the third stage of labor, and the control of the uterus for at least one hour after parturition. The cavum uteri will thus be completely evacuated, the walls will possess their normal tonus, and the entire organ will be placed in the most favorable state for rapid involution. The Vienna plan of gentle friction of the fundus every twelve hours for the first two days maintains retraction, while it does not interfere with the process of puerperal thrombosis. The same plan has been adopted in the Rotunda by the President of the British Gynæcological Society. This practice, which in Dublin has been dubbed "Schultzeing" the uterus, is far more effective than the use of ergot, strychnine, or quinine.

The bladder must be emptied at regular intervals,—say three or four times a day,—from the beginning until the end of the lying-in period. The catheter may usually be dispensed with, if the woman be taught to urinate in the horizontal position before her confinement. The canonical laxative on the third day and the subsequent daily evacuation of the sigmoid flexure and rectum are items that demand scrupulous attention.

Posture of the woman in bed is of moment, especially during the second week, when the greatest diminution in the size of the womb occurs. During this period the puerpera ought to lie on either side, and avoid as much as possible the protracted dorsal decubitus. At the end of the first fortnight, in normal cases, the woman may be permitted to get up. The minimal length of time that the puerpera should remain in bed is no longer a question for discussion. Goodell, indeed, advises a briefer period, as the "conclusion of a long and well-sifted experience." But in reaching this conclusion, he has, doubtless, been influenced by a custom of the Greeks and Romans, among whom it was the rule for the woman to take a bath on the fifth day. This brilliant writer also cites the play of Plautus, entitled "Truculentus, or the Churl," in which a woman receives her lover on the fifth day. But a squaw can do the same thing, and in Southern Illinois female tramps cherish a like tradition. Physiology and the universal experience of mankind, however, teach us that these experiments are hazardous. The size,

form, and position of the uterus ought always to be ascertained by careful bi-manual palpation before the woman is permitted to leave her bed. In the event of a posterior displacement, now, if ever, is the time for its correction. Reduction is commonly very easy, and the organ can be permanently secured in the majority of cases by the use of a suitable pessary. Sometimes the systematic employment of the genu-pectoral posture, with the admission of air into the vagina, suffices. In this class of cases Thure Brandt has scored excellent results by his system of abdominal massage and uterine gymnastics. We speak from personal experience as to the efficacy of the plan of prevention and treatment that we have outlined. During the last five years we have paid particular attention to the subject of this note, and up to the present have encountered no case of posterior displacement that proved unmanageable.

METHYLACETANILIDE, OR EXALGINE.

METHYLACETANILIDE, described as a new analgesic in the THERAPEUTIC GAZETTE for May 15, 1889, page 339, continues to attract considerable attention from continental pharmacologists. Dr. Binet has recently published a number of observations with this substance, which, in the main, confirm the clinical and physiological effects determined by Drs. Dujardin-Beaumetz and Bardet in the Cochin Hospital. Dr. Binet states that it diminishes motor power in all animals, and in this respect is closely analogous in its effects with formanilide and methylformanilide (*Nouveaux Remèdes*, June 8, 1889). It produces local paralysis in the muscles which are the seat of the injection, arrests the heart, diminishes oxyhæmoglobin, and interferes with the oxygenation of the blood. Its antithermic action is quite as marked as that of acetanilide. In mammals its action differs considerably from anilide and methylformanilide. In subcutaneous injections it produces within one or two minutes clonic epileptiform convulsions, with profuse salivation, the attacks of convulsions being separated by periods of relapse, in which there is more or less cyanosis, difficulty of breathing, and agitation. The convulsions so produced, it is stated, may be arrested by inhalations of ether. The convulsions are of cerebral origin, but there is also a certain degree of excitation of the spinal cord. The temperature is rapidly reduced by the injection, the reduction appearing within ten minutes after subcutaneous injection, and attaining its maximum in about three-quarters to an hour later. It generally amounts to 2° or 3° C. with medium doses, but with poisonous doses may amount to 10°. This reduction of temperature, likewise, follows its internal administration, or its use through rectal injection. Small doses produce slight increase of blood-pressure, the pneumogastric nerve preserving its irritability. Death is produced in mammals by interference with oxygenation of the blood, which, after death, is dark prune colored, and shows the presence of abundance of methylhæmoglobin. The urine never contains blood, but preserves its amber color. It does not contain albumen, nor is the special coloration produced by the perchloride of iron. It is said to reduce Fehling's test. The fatal dose for the rat amounts to ⅓ to ½ a grain. For the guinea-pig, ⅓ of a grain for one-fifth pound body-weight. In the rabbit 9 grains have been injected into the vein before death was produced, while in the cat a subcutaneous injection of 4 grains produces serious symptoms of poisoning. As in formanilide, it is stated that animals which have been subjected to this injection acquire a certain degree of immunity to subcutaneous doses, and the quantity given must be larger to produce any effect. The convulsive action is especially reduced by the animal becoming accustomed to the drug, perhaps from the convulsive centre becoming less impressible to its toxic action.

It thus appears that exalgine is a much more active poison than would be suspected from the statements of Beaumetz; while it will further be noticed that Dr. Binet makes no mention of any analgesic effect as following its administration. At all events, exalgine is a substance which should never be given but with the greatest circumspection.

According to M. H. Giraud (*Lyon Médical*, June 23, 1889), the product prepared by Brigonnet, and presented by him under the name of exalgine, has not the constitution which he attributes to it. According to him, the name of "orthomethylacetanilide" should be given to the body described by Beilstein and Kuhlberg under the name "aceto-ortholuidine." Its true designation should be methylacetanilide, and it cannot exist under three modifications, for the radical phenyl contained in its molecule is not substituted. The prefix "ortho" should, therefore, be omitted, for there can be no *meta* and *para* varieties. The methyl group does not substi-

tute one of the hydrogens of the benzol ring, but of the side ring, in which there is only one product possible, when the hydrogens are replaced by certain organic radicals.

In the *American Druggist* for July, 1889, a note is published in which it is stated that methylacetanilide has been experimented with, to some extent, in one of the New York hospitals and has been found to produce partial or entire insensibility to pain, such as that caused by various forms of neuralgia, etc., as had been reported. It has, however, not yet been available in sufficient quantity to make extensive experiments.

Regarding the chemistry of methylacetanilide (first described by Hepp and Hofmann in 1874, *Ber. d. Deutsch. Chem. Ges.*, vol. x. 328, 599), the following explanation will suffice:

When an atom of hydrogen, in the benzol ring C_6H_5, is replaced by amidogen, NH_2, the resulting product is *aniline*, $C_6H_5NH_2$, which, for this reason, is also called *amidobenzol*. If we now imagine *one* of the hydrogens of the group NH_2 to be replaced by a monatomic rest of a fatty acid,—that is, a fatty acid less one molecule of hydroxyl (OH),—we obtain an *anilide*. Acetic acid is $C_2H_4O_2$, or $-C_2H_3O.OH$. When the group C_2H_3O replaces one of the hydrogens in aniline, we obtain the *acetanilide* (known otherwise as antifebrin):

$$\underset{\text{aniline}}{C_6H_5NH_2} + \underset{\text{acetic acid}}{C_2H_3O.OH} = \underset{\text{acetanilide}}{C_6H_5NH(C_2H_3O)} + \underset{\text{water.}}{H_2O}$$

Similarly, if formic acid, CH_2O_2, or CHO.OH, were to enter into combination with aniline to form an anilide, we would obtain *formanilide*:

$$\underset{\text{aniline}}{C_6H_5NH_2} + \underset{\text{formic acid}}{CHO.OH} = \underset{\text{formanilide}}{C_6H_5NH(CHO)} + \underset{\text{water.}}{H_2O}$$

This substance, formanilide, by the way, has recently been found to possess most remarkable properties. Injected into small animals, in doses of ½ grain, it produced complete immobility, insensibility, and apparent death, from which the animal usually recovered after some time.

In the same manner various other anilides are formed. It may be added that the above explanation of the formation of anilides is not the one usually given. For certain reasons, which need not be given here, they are usually regarded as derived from acid amides, by the substitution of C_6H_5 (phenyl) for one of the hydrogens of NH_2. But in the end the result would be the same.

Now, there is still *one* atom of hydrogen left in the series of anilides mentioned above. But this may also be replaced by a monatomic radical, such as CH_3 (methyl), C_2H_5 (ethyl), etc., and thus we obtain compound anilides; for instance:

$C_6H_5N \left\{ \begin{matrix} CH_3 \\ C_2H_3O \end{matrix} \right.$ = methylacetanilide (or "exalgine").

$C_6H_5N \left\{ \begin{matrix} C_2H_5 \\ C_2H_3O \end{matrix} \right.$ = ethylacetanilide.

$C_6H_5N \left\{ \begin{matrix} CH_3 \\ CHO \end{matrix} \right.$ = methylformanilide, etc.

Now, *exalgine* is the first mentioned among the above three compounds. It is prepared by acting upon sodium-acetanilide with iodide of methyl. It appears in needles or long tablet-like crystals, is sparingly soluble in water, readily in hot water, also in dilute alcohol, or in water containing a little alcohol.

AGARIC ACID.

SINCE the recommendation in 1882 by Dr. J. M. Young of the use of agaracine for suppressing perspiration, it has been subjected to numerous chemical investigations. In 1883, E. Jahns, in addition to other substances, separated a body from white agaric (*polyporus officinale*), which proved to be identical with the crystalline agaric acid obtained by Fleury in 1870, and with the agaracine of Schoonbrodt. This body is a dibasic, triatomic acid, homologous to malic acid. Its formula is—

$$C_{14}H_{27}(OH)\begin{matrix} COOH \\ COOH \end{matrix}.H_2O.$$

Schmieder confirmed these results, and Hofmeister proved that, of the numerous bodies contained in agaric, it was only this agaric acid, or agaracinic acid, which possessed the power of reducing perspiration. In spite of these conclusions, the substances sold in the shops under the names of agaracine or agaric acid are by no means simple bodies. Thus, Hofmeister found that the agaracine of commerce contained agaricol, a substance which was totally inactive, and was to be regarded as a contamination, while the agaric acid contained a mixture of the so-called "red rosin," the probable cause of the

cathartic action of agaric. Pure agaric acid is a white, glistening, light crystalline powder, which, under the microscope, is found to consist of quadrangular tabular crystals, and when recrystallized out of absolute alcohol, forms groups of needles or rosettes. The melting-point is 138° C.

The free acid is only slightly soluble, in cold water, but readily soluble in boiling water, and on cooling is redeposited in a crystalline form. All the salts of this acid, in combination with alkalies, are readily soluble, but the combinations with the heavy metals, on the other hand, are insoluble. Hofmeister has recently subjected the pure agaric acid to accurate physiological investigation, and his results are reported in the *Therapeutische Monatshefte* for June, 1889. From the similarity of action of agaric acid and atropine on the sweat secretion, it is of interest to determine as to whether this similarity is restricted to this single point, or whether the parallelism extends to other actions. Of Dr. Hofmeister's results, the following deserve attention from their general interest. In the first place, he found that if agaric acid should perhaps not be included among the list of actively poisonous substances, it was not to be regarded as inert.

Applied locally, marked irritation is produced, which, in subcutaneous injection, produces marked inflammation, extending to suppuration. An internal administration of doses of from 7½ to 15 grains produces vomiting and diarrhœa. In cold-blooded animals it produces gradually increasing paralysis and reduction of activity of the heart. Agaric acid is, however, not capable of antagonizing the action of muscarine,—that is, it will not, like atropine, start the heart of the frog which has been arrested through the action of muscarine. In warm-blooded animals, from the slow absorption, internal administration of the pure acid does not produce any very marked results. In subcutaneous or intravenous injections of the soluble sodium salt, the action is principally exerted on the pneumogastric and vaso-motor centres of the medulla; both centres are at first excited, and then paralyzed. As a consequence, there is at first slowing of the pulse and increase of blood-pressure, followed by fall of the latter. Death follows after convulsions, from arrest of respiration, but in animals in which artificial respiration is maintained, death is not prevented, but is then attributable to great reduction of blood-pressure. Unlike atropine, agaric acid possesses no mydriatic action, but when the sodium salt is instilled into the conjunctiva severe irritation is produced, and, indeed, slight contraction of the pupil results, which may, however, be overcome through the use of atropine. The influence of agaracine on the sweat secretion is not central, but depends upon direct action on the secreting apparatus. Irritation of the sciatic nerve in animals under the influence of agaracine does not produce any secretion of sweat, although pilocarpine is even now active. Therefore, the similarity between atropine and agaric acid is confined to the influence of these two drugs on the sweat-glands. The degree of action is, however, different. Thus, Brobsting estimated that the influence of agaracine on the perspiration is twenty times less than that of atropine, and Hofmeister concludes that even this estimation is still too favorable for the agaric acid.

Hofmeister's investigations would seem to indicate that for therapeutic purposes the pure agaric acid alone should be employed, and that when this substance is given internally there need be no fear of vomiting or diarrhœa. In Professor Kahler's clinic doses of from ¼ to 2 grains were given repeatedly without any symptoms of poisoning, with the exception of transient nausea. Doses of from ⅓ to ½ grain were exceptionally well borne; and since the power of reducing perspiration only occurs after several hours after the administration, and then persists for twenty-four hours, the employment of repeated small doses is greatly to be preferred to the administration of a single large dose. The subcutaneous injection of the soluble sodium salt is to be avoided, as tending to produce severe local irritation. In this connection we may recall to our readers that Dr. Pope, in the THERAPEUTIC GAZETTE for June 15, 1888, noted that doses of ⅛ of a grain in the majority of cases completely controlled the night-sweats of phthisis, even after atropine had failed. Dr. Radcliff also likewise reported in the same number of the GAZETTE several cases of night-sweats which were relieved through the use of this remedy.

MENTHOL IN FURUNCULOSIS OF THE EXTERNAL AUDITORY CANAL.

THE statement of Loewenberg that furunculosis of the external ear is due to the micrococcus, the staphylococcus pyogenes aureus, has been confirmed by a number

subsequent investigators, and furnishes an important indication for the therapeutics and prophylaxis of this affection. In the treatment of furunculosis of the exterior auditory canal, the principal difficulty which is met with is in the great contraction of the calibre of this canal, due to the swelling produced by the inflammation. As a result of this, applications to the deeper part of the canal are rendered difficult or impossible, and one boil is followed by another as a result of auto-infection. In combating this difficulty, Dr. R. Cholewa (*Therapeutische Monatshefte*, June, 1889) was led to employ menthol,—a remedy which was already known to possess considerable energy in reducing swelling in the nose and commencement of the Eustachian tubes, at the same time possessing marked antiphlogistic and analgesic properties. He states that his experience with the use of this remedy has shown him that pledgets of cotton, moistened with strong solutions of menthol in oil, and introduced into the external auditory canal, rapidly reduce inflammation and swelling in furunculosis of that canal. He claims, however, that its value in this affection is not due solely to the above properties, but especially and above all to its acting as a bactericide. Dr. Cholewa refers to the results obtained by Koch and others, which showed that a menthol solution of 1 to 2000 was capable of destroying cholera bacilli, the bacilli of tuberculosis and diphtheria, and of splenic fever. The author himself undertook a series of experiments, with the assistance of Dr. Rönick, to determine the influence of menthol on the development of the bacilli. Their conclusions would seem to show that weak solutions of menthol, and even the vapor of menthol, are entirely capable of arresting the growth of these micro-organisms. This result, he claims, is sufficient to explain the great value of menthol in this affection. He employs, as already stated, cotton pledgets moistened in twenty per cent. solution of menthol in oil, tightly twisted up and inserted into the external auditory canal. The slight burning produced by this application soon disappears, and pain is rapidly relieved. This application is renewed every twenty-four hours, and is continued until the inflammatory process is cured. If the furuncle has extended so far as abscess-formation, it is opened with a bistoury, and the after-treatment with menthol employed as before. Only a few doses are claimed by the author to be required before entire relief is obtained.

THE DIURETIC ACTION OF MILK SUGAR.

At the recent meeting of the French Academy of Medicine, M. Germain Sée presented an interesting note as to the diuretic effects of milk sugar,—a paper which largely goes to explain the diuretic effects attributable to milk, and well recognized by most physicians as one of the best of all diuretics, succeeding when apparently more potent remedies have failed. As long ago as 1879, Moutard-Martin and Richet, from experiments made in Vulpian's laboratory, determined that lactose, saccharose, and glucose all possess considerable diuretic properties. In experiments on curarized dogs, a canula being inserted into the ureter, they found that if a little syrup was injected into the veins, that the rapidity of the flow of urine was increased ten, twenty, or even thirty-fold. These authors likewise confirmed their conclusions by observations made at the sick-bed, and their results there obtained substantiated their strictly experimental observation that lactose was a marked diuretic.

As is well known, milk is a typical food, and fills an important *rôle* in the therapeutics of diseases of the stomach and heart, while it in practice is largely used in diseases where diuretics are indicated, such as dropsy of cardiac or renal origin. Sée attributes this diuretic action to lactose, and he claims that lactose is the most powerful, as well as the most sure, of the diuretics known. He holds that when two quarts of milk are given to a patient, all the advantages of diuresis are obtained, without its inconveniences; while, on the other hand, the glycosuria apt to be produced by a strict milk diet is avoided by the use of lactose. Dr. Sée claims that with the administration of two ounces of milk sugar, diluted in two quarts of water, all other liquids of any kind being suppressed, marked diuresis is obtained in all cases of heart-disease whatever their nature, with the single exception that its action is less constant in arterio-sclerosis. In *La Tribune Médicale* for June 20, 1889, and *La Pratique Médicale* for June 18 and June 25, 1889, Dr. Sée published an account of his experiments in this connection. He states that he has careful notes of twenty-five cases in which the most abundant diuresis was produced by the employment of this method of treatment, the flow of urine immediately falling when the administration of milk sugar was suppressed. He believes that lactose is, therefore, one of the best diuretics, while at the same time absolutely

innocuous, and it is lactose to which milk owes its diuretic properties. The other constituents of milk, especially the water and the salts, have no manifest or useful action, chloride of sodium adding nothing to the diuresis obtained by milk, the sugar and the salts of potassium being little more efficacious. If milk is given in quantities of two quarts, diuresis is produced, but when four quarts are given, a quantity which will contain about six ounces of milk sugar, considerable glycosuria will be developed; while at the same time there will be a marked excretion of urea indicating the destruction of the albuminates. By using the milk sugar alone, however, these inconveniences are avoided. Three ounces of milk sugar, given in the twenty-four hours, will produce an enormous diuresis, more than an equivalent to that which might be obtained with four or five quarts of milk. As much as two or three quarts of urine may be passed daily under the use of this treatment, and under its employment any dropsy present will be almost surely reduced. The degree of diuresis produced by lactose increases up to the third day. It then remains stationary, and then becomes somewhat less for several days; but a short time later, even under the administration of the same amount of milk sugar, the diuresis will again regain its original degree. Dr. Sée claims that while lactose acts as a favorable diuretic in cases of dropsy of cardiac origin, it is not so efficacious in the dropsy of renal affections. In the former class of affections it is claimed that it never fails, unless the kidneys are the seat of Bright's disease, and in which there is a considerable daily elimination of albumen. When the quantity of albumen is small, the result in this affection also may often be favorable. Sometimes the administration of lactose will produce diarrhœa, when naturally the diuresis will be diminished. In other cases, the patients may have been subject to profuse sweating, when likewise the polyuria will be diminished. As a rule, however, it is claimed that the remedy is perfectly supported, and may be given for eight or ten days without interruption, and then suspended for a day or two to have its employment renewed. If the simple solution of milk sugar is badly tolerated, it may be aromatized with brandy or mint, all other liquids being suppressed during its administration. If what Dr. Sée claims is absolutely correct, the advantages of this remedy are very considerable, for it does not confine the patient to any restricted diet, and does not necessitate the prohibition of meat. It would seem that lactose acts directly on the kidneys, since the pulse and blood-pressure remain normal after its use. It, therefore, differs from digitalis, convallaria, and strophanthus, which are diuretics to the extent to which they increase blood-pressure. Dr. Sée would place lactose in the group of pure renal diuretics, in which he likewise locates caffeine and theobromine as remedies which increase the flow of urine without influencing the degree of vascular pressure. Dr. Sée relates numerous cases of dropsy from heart-disease which appear to have been favorably influenced by lactose, even when employed during the stage of imperfect systole. If, however, the asystole is complicated by dyspnœa, lactose is then powerless, though its action may be seconded by the iodide of potassium.

METHYLIC CHLOROFORM AND THE SO-CALLED METHYLENE BICHLORIDE.

THE organic lesions which contraindicate the use of chloroform as an anæsthetic are well recognized, but a certain number of accidents follow its use which are only attributable to individual susceptibilities or peculiarities, which may escape our most careful examination. It has been recently affirmed that *pure* chloroform never kills; but death by syncope may be produced by any anæsthetic, no matter what precautions are taken by the physician. But, aside from these fatal accidents, consequences may occur which are but little less serious; thus vomiting, which may occasion the most dangerous intestinal hernia after laparotomy, or cause the tearing out of stitches after various abdominal operations. This latter class of accidents appear with more justification to be attributable to the impurity of the chloroform, for they gain in frequency when the anæsthetic contains other alcohols than the methylic alcohol. We have already, in the GAZETTE for January 16, 1888, and December 15, 1887, alluded to the use of methylene chloride as an anæsthetic, where we called attention to the preparation employed by Spencer Wells as an anæsthetic in his ovariotomy cases, showing that this was not by any means pure methylene chloride, but was a mixture of one part of methyl alcohol and three or four parts of chloroform. This mixture of chloroform and methylic alcohol was recommended by Drs. Eicholz and Genther as preferable to chloroform, as possessing less toxicity and equal narcotic power, and less dangerous, from the fact that it influ-

ences the circulation and respiration to a less extent than chloroform, a fact which is in support of the generally recognized principle that in the various chlorine compounds the danger is in direct proportion to the percentage of chlorine. M. Polaillon recently read a memoir before the French Academy of Medicine (*La Pratique Médicale*, July 2, 1889), in which he communicated the results of his experiments with methylic chloroform (four volumes of chloroform containing one volume of methylic alcohol). He was led to the employment of this anæsthetic through the fatal results which recently followed at his hands the employment of chloroform as an anæsthetic; and he has now employed this methylic chloroform in seventeen different instances in women. In two of these the anæsthesia was incomplete, while in fifteen others the sleep was very satisfactory, and might have been readily prolonged indefinitely without inconvenience. Vomiting occurred three times after wakening, once during the narcosis, and in this case the vomiting produced prolapse of the intestine after a laparotomy. He believes, however, that the sleep produced by methylic chloroform has advantages over that due to ordinary chloroform,—the awakening is much more easy, and the discomfort much less. He contends, therefore, that it might be substituted with advantage for ordinary chloroform. Polaillon has likewise employed this agent in ten operations on the male subject; in four cases it was not possible to narcotize the patient, although the attempt was persisted in for more than half an hour. In one case, at the end of seventeen minutes, there was only reduction of sensibility without anæsthesia. In another case, twenty-three minutes after the commencement of administering the anæsthetic, symptoms of asphyxia were noted, and necessitated the performance of tracheotomy. In four cases the anæsthesia was complete, once in ten minutes, one between ten and fifteen minutes.

He, therefore, concludes, that in man the action of methylic chloroform is very slow, that many subjects are rebellious to it, but that the narcosis is very satisfactory when once the anæsthesia is obtained. It thus seems that the slowness of methylic chloroform, and its unreliability in producing narcosis, is a great drawback to its use, and the question arises whether this slowness is counterbalanced by its freedom from danger. Here, of course, a large number of observations are necessary before a reply can be given. It does not seem that we can hope for an affirmative, for in one of Polaillon's cases asphyxia is stated to have occurred. Polaillon, however, believes that it is much less dangerous than pure chloroform.

In the discussion which followed the reading of his paper, M. Leon Le Fort (*Le Progrès Médical*, June 29, 1889) stated that he had employed this methylic chloroform for six years without a serious accident, and that on awakening from the narcosis the patient is not, as is so often the case with chloroform and ether, in a state of agitation for the rest of the day. He likewise prefers it to the pure chloroform.

Reports on Therapeutic Progress.

POISONING BY WATER-GAS, AND A NEW METHOD OF TREATMENT.

The subject of the use of water-gas as an illuminating agent has been attracting much notice for several years past, and within the past six years the interest in the subject has greatly increased, owing to the persistent efforts which have been made by interested parties to introduce plants for its manufacture in those States whose citizens have been protected from its direful effects by statute laws.

The symptoms presented by persons affected by the inhalation of this gas do not differ widely from those seen in persons who are deeply unconscious from the effects of other lethal poisons, except that the coma is more persistent and profound, and continues for several hours, with no marked change until near the end of life; then a sudden change in the respiration, a rapid failure of the heart's action, then a few forcible respiratory movements, and the breathing suddenly ceases, and the patient is dead.

As is well known, the poisonous element in water-gas is carbon monoxide, which, when inhaled, produces rapid death by forming a compound with the hæmoglobin which is more stable than that formed by carbon dioxide, and cannot be readily decomposed by oxygen, so that the blood is thus incapable of absorbing oxygen. In coal-gas used for illuminating purposes analysis has shown that carbon monoxide is present in 5.53 per cent., while in water-gas it amounts to 27.46 per cent. In the *Boston Medical and Surgical Journal* for July 11, 1889, Dr. D. A. Cleaveland reports two cases of poisoning, occurring in women, through inhalation of water-gas which had

escaped into their room while they were probably asleep. One woman was not so deeply affected as the other, and when seen by Dr. Cleaveland was slowly regaining consciousness. The other was found lying upon her bed in a corner of the room remote from the windows, and when seen by Dr. Cleaveland was in profound coma. The countenance livid, the extremities cold, and in fact but little, if any, warmth of any part of the body that was exposed. The coma was completely anæsthetic, and there was an entire suspension of all sensory functions. The pulse would beat eight or ten times with a fair fulness and then run down to a mere flutter, and for a moment be entirely lost at the wrist. Then, again, there would be a few quite forcible beats, followed by rapid diminution and entire suspension.

The respiration corresponded in character, if not in rhythm, with the pulse, there being a few forcible respiratory movements, succeeded by a rapid diminution in their depth until they would cease altogether. Then a sudden forcible inspiration would follow, to be succeeded by the rapid decline and suspension.

There were facial spasms of the right side and large dilatation of the right pupil.

Mucus was collecting in the trachea, giving rise to what is known as the death-rattle.

Hypodermics of ammonia, atropine, and other heart stimulants had been employed; artificial respiration had been kept up almost continuously, with the patient almost constantly exposed to a current of fresh air. Besides this about twenty feet of pure oxygen had been administered by inhalation, and all without the least appreciable effect. Dr. Cleaveland resolved upon transfusion with milk. The patient was bled from the arm until the weakness in the heart-beat gave warning that the limit of safety had been reached, ten ounces in all of blood being withdrawn, and ten ounces of milk were then slowly injected into the median cephalic vein above the right elbow.

The first indication of returning sensibility was noticed when the needle was pushed a little too high in the vein, when nearly through with the injection, and its end impinged against the coats of the vein at the point of union of the cephalic and median cephalic. This sensibility was manifested by a motion, as if caused by a twinge of pain.

Two hours after the operation there was a marked improvement in the appearance of the patient, and four and a half hours after the operation she swallowed and retained stimulants, which she had not done before since she was discovered at 7 A.M., twelve hours previously.

There was on the day following quite a marked redness in the track of the vein above which the opening was made, but it soon subsided on the application of warm lead and opium wash. Excepting this and a very small abscess near the point of incision, which Dr. Down opened as soon as it was in suitable condition, and which did not gather again, there was no further trouble with the arm.

There was also a large and troublesome abscess formed at the angle of the jaw, which was evidently caused by the cold wind blowing on that point for a period of six or seven hours, but there were no unfavorable results from it. Twenty-five days after the operation she was able to sit up, and continued to improve until she perfectly recovered, and has remained well up to the present time.

The advantage of the method of treatment employed by Dr. Cleaveland is to be found in the substitution of milk for blood in transfusion, for in many cases the instruments for drawing the blood and other necessary requirements for the operation of transfusion may not be at hand, even if the blood be attainable. The report further shows how the necessary instruments may be extemporized in an emergency, and will prove as efficacious as any other. Thus, the instruments employed by Dr. Cleaveland were simply a clean Davidson's syringe, an aspirator-needle, the point of the needle being cut off and smoothed on a whetstone, and the needle attached to the nozzle end of the syringe. After as much blood as is safe is removed by bleeding, the orifice in the vein is to be compressed so as to prevent entrance of air, and, after carefully filling the syringe and needle with milk, the needle end may then be introduced into the vein, and about ten ounces very slowly injected.

THE TREATMENT OF SEVERE SUBACUTE RHEUMATISM WITH MASSAGE.

In the *Lancet* for June 22, 1889, MR. H. W. MCCAULLY HAYES reports a case of a strongly built, muscular young man, who was almost completely crippled by a severe attack of muscular rheumatism. He could not use his arms or hands, nor could he stand. He

could not sit up, owing to the severe pain in his back, and it was with great difficulty that he could bend his knees. His hips were so painful that he could not bear them touched, and he complained of a severe pain, superficial in character, in the region of the occipito-frontalis muscle. In addition to this he was greatly distressed by pain in the region of the diaphragm, so much so that on some days he suffered agony on coughing or hiccoughing, and was quite unable to take a deep inspiration. His temperature was 99° F. His previous history was decidedly rheumatic, he having suffered from rheumatic attacks on and off for the past three years. His health was very good during the intervals of the attacks, and he used to take a great deal of out-door exercise in the shape of tricycling, tennis, and boating. Last September he spent his holidays on the river and frequently got wet, and two or three days before this attack he felt a little shivery and out of sorts. The joints were slightly swollen, a little redder than usual, and very tender. His shoulders and the muscles of the immediate neighborhood of the joints were very painful, and the muscles of the forearms were quite useless on account of the pain he suffered when they were used. Both wrist-joints were affected, and the palm of the left hand was exceedingly painful, the middle and ring fingers of the same hand being nearly bent in upon the palm,—that hand being quite useless. All the muscles of his back and those round the hip-joint exceedingly painful. Both knee-joints were affected, the pain being especially severe at the internal condyles. The soles of his feet were exceedingly painful and tender, so much so that he could not bear the slightest pressure upon them, and could not walk. He had a mitral systolic murmur, and the area of cardiac dulness was increased downward and slightly to the left. Urine, high colored, acid, with a copious deposit of urates on standing.

The patient had been treated with alkalies in the early part of this attack, but not getting relief, Mr. Hayes recommended massage, and employed it himself, all medicine being stopped with the exception of a few doses of iodide of potassium, which had to be discontinued on account of the early appearance of the physiological effects of the iodide.

A general shampooing was performed over all the painful parts, and at first he could scarcely bear this process at all. The earlier ittings lasted from ten to fifteen minutes, but ... was gradually increased, till at the end of the second week each sitting lasted from thirty to forty minutes. The first sign of improvement was that he began to sleep better at night. After this the pain began to pass gradually away from the different parts in the following order: First, from the muscles of his back and neck, the improvement in this respect being shown by his being able to sit up; then his shoulders and knees got better, and his hip-joints were also much better; in fact, quite comfortable. His wrists did not show much improvement, and, with the palms of his hands and the soles of his feet, resisted treatment for a long time. The pain in the region of the diaphragm was about the last to disappear. The good effects produced by firmly kneading the muscles was shown in this case by the result which followed this procedure when applied to the muscles of the back and neck and to the structures over the large joints. Pétrissage and effleurage were applied to the region of the diaphragm, and combinations of these methods, together with tapotement and friction, were applied to the other parts affected. The patient is now actively employed, and is keeping very well. During the course of massage, which extended over six weeks, hot baths containing washing soda were found very grateful.

THE TREATMENT OF GONORRHŒA.

In the *Medical Record* for July 20, 1889, Dr. E. P. Rice summarizes as follows his method of treating gonorrhœa. The patient should be placed in the recumbent position, and, after lubricating an ordinary soft rubber catheter with five per cent. carbolized oil, introduce it as far as the prostatic portion of the urethra. In acute cases it may be necessary to inject a little five per cent. solution of muriate of cocaine, if pain is produced. Now insert into the free end of the catheter an ordinary glass syringe, having a nozzle with an opening sufficiently large to allow the liquid to pass through easily, which will be about the consistence of an ordinary emulsion, and should be made as follows:

℞ Acid. boric., ʒiii;
Glycerini, ʒi.

Mix, and rub well together, and shake well before using.

Pour about two drachms of this mixture into the syringe, having previously withdrawn the plunger. Now, gently insert the plunger, and force the liquid into the catheter, which is held in place with the thumb and fore-

finger of the left hand; the forefinger of the right hand should be used to force in the plunger. After all the liquid has passed out, gently withdraw the catheter, stripping it at the same time in order to force all the liquid into the urethra. Let the patient remain in the recumbent position for ten minutes longer, the whole operation lasting generally about fifteen or twenty minutes. This treatment should be repeated every day, for the first two or three days, and then on each alternate day. As a rule, in acute attacks, five or six treatments will suffice. In long-standing cases the same treatment should be used, alternating with some mild astringent injection used in the same way. The sound should always be used in subacute and chronic cases, at intervals of about three days. It is also advisable to give internally, in all cases, a saline laxative, and in the old cases I generally give, in addition, capsules of bal. copaibii, ℥vi; ol.cubebæ, ℥iv, t. i. d., either before or after meals.

The fact of antisepsis should never be lost sight of, as so many are apt to do. It is a well-known fact that boric or boracic acid is a mild and unirritating antiseptic, which, when combined with glycerin as a vehicle, also an antiseptic, renders it a very safe agent to use for this purpose.

One important point is also gained in this plan. We always have the patient practically under control, and can watch the progress made, not being dependent upon the say-so of the patient.

THE METHOD OF OPENING BUBOES.

The best method of opening a bubo is a matter of much greater importance than at first sight appears, especially to the military surgeon, who is apt to have many of them at one time undergoing treatment. In a recent number of the *British Medical Journal*, Dr. Curran drew attention to the advantages of aspiration *versus* free incision in the evacuation of suppurating buboes. In the *British Medical Journal* for July 6, 1889, Dr. J. P. H. Boileau writes that he long ago abandoned the method of free incision in opening buboes, and he now invariably employs a mere puncture with a narrow-bladed bistoury. By this method an "open bubo" is avoided, as well as the reproach of a protracted cure; not in all cases, though, for sinuses will form that must be opened up, and the consequence of neglect or a vitiated state of constitution must be dealt with. Dr. Boileau claims that the opening of the bubo by free incision, instead of by puncture, often extends the duration of a case from days to weeks, or from weeks to months.

It is necessary to observe that to obtain the best results a bubo should be opened at the proper time; not too soon before a sufficiency of morbid deposit has broken down, nor too late when the vitality of the tissues may have become impaired. The experienced operator chooses the right time, which is probably a very few days after the presence of pus has been diagnosed. The small opening made by the bistoury will often be found closed the following day; it may be reopened by a blunt-pointed probe, if necessary.

The puncture is much less painful than the free incision, and it, of course, has the advantage of leaving but a very small mark, while it has no disadvantage, as it can at any time be converted into as long an incision as may be thought necessary.

THE OCCASIONAL USE OF SOLUTIONS OF NITRATE OF SILVER IN THE TREATMENT OF CHRONIC LARYNGITIS.

At the meeting of the American Laryngological Association, recently held at Washington, D. C. (*Boston Medical and Surgical Journal*, June 27, 1889), Dr. S. Solis-Cohen reported several cases in which local application of nitrate of silver was employed for the relief of chronic laryngitis, such as occurs so often in singers, clergymen, lawyers, etc., in which, after all discoverable sources of irritation, local and general, have been removed, and approved topical treatment suitable to the individual cases has been faithfully tried for a longer or shorter time, improvement takes place to a certain point and then stops. Perhaps all visible evidences of disease, except an irregular, pinkish striping of the vocal bands, have disappeared, or perhaps there would be a faint uniform coloration, or maybe only a loss of lustre, but something there would be that persisted, and that prevented the patient from resuming with comfort full use of the voice in singing or speaking, or perhaps even in ordinary conversation.

It is in such conditions as these—the last obstinate remnants of the disease—that he had derived considerable satisfaction from the topical use, by sponge, cotton-wad, or brush, of weak solutions of silver nitrate, about ten grains to the ounce, application being made every day for some two or three

days until some congestive reaction is produced; after that at longer intervals. In the course of treatment, too, in some cases before reaching the last stage above described, he had found recovery apparently hastened by occasionally substituting stronger solutions of silver nitrate, forty to sixty grains to the ounce, for the iodized glycerin, tannin, tar, or other routine application. A visible increase in congestion immediately follows the use of the silver solution, but this passes off quickly, and at the next visit great improvement is usually manifested. These applications are made once in about two or three weeks, according to circumstances.

CAFFEINE IN THE TREATMENT OF ADYNAMIC CONDITIONS.

Nearly every one acknowledges the diuretic action of caffeine, but that it will act as a cardiac tonic and excitant when injected subcutaneously is not as generally admitted. Perhaps the reason for this condition is the fear as to the dangerous results of large doses of caffeine. In the *Revue Générale de Clinique et de Thérapeutique*, June 20, 1889, Dr. Henri Huchard claims that the efficacy of subcutaneous injections of caffeine is superior as a cardiac stimulant to that of ether, and he refers to a number of cases which seems to substantiate his claim. One of these was a subject suffering from an attack of pneumonia on the right side, which, twelve days later, extended to the left lung, and during the entire attack was accompanied by intestinal complications of the nature of dysenteric colitis and profound depression. There was extreme feebleness, frequent threatenings of syncope, condition of subdelirium, cardiac adynamia, and necrosis of the inferior maxillary bone. During the space of thirty days Dr. Huchard practised ninety-five injections of 4 grains each of caffeine, fifty-one injections of ether, and nineteen injections of nitro-glycerin, the latter being administered to prevent accidents due to cerebral anæmia. The patient was cured, and no general or local accidents followed the one hundred and sixty-five injections, with the exception of a single abscess. In addition, Dr. Huchard refers to five other cases in which caffeine employed alone appeared to produce remarkable results. One of these was a severe case of typhoid fever, in which fifty similar injections were employed, and terminated in cure. Four other cases of severe pneumonia are also referred to in which great benefit appeared to follow the injections of caffeine. Dr. Huchard insists upon the necessity and the utility of large doses, and he writes that he does not hesitate to employ doses of from 30 to 45 grains of caffeine in twenty-four hours, administered subcutaneously. Dr. Huchard claims that his experiments have shown him that caffeine, before acting on the heart, exercises marked action on the central nervous system; and there is thus, therefore, a marked difference in the action of digitalis and caffeine, the former being primarily a cardiac remedy, the latter acting first on the nervous system.

THE PREVENTION OF PUERPERAL SEPTICÆMIA.

At the meeting of the Ontario Medical Association, recently held at Toronto, Canada, Dr. A. H. Wright contributed an excellent paper on "The Prevention of Puerperal Septicæmia" (*Medical Record*, July 20, 1889). He said he considered no apology was necessary for bringing such an ordinary subject before the meeting, for he maintained this matter should be continually discussed until sepsis became practically unknown in the lying-in room. It is anything but creditable to the medical profession that puerperal septicæmia is more common in private practice than in well-conducted hospitals? We are not to judge its effects simply from its death-rate, but must also take into account the amount of misery and suffering resulting from the milder forms of septicæmia. Can we prevent this septicæmia? Dr. Wright answered this question in the affirmative. How can it be done? By thorough and perfect cleanliness on the part of ourselves, and the essentials for such are hot water, soap, a nail-brush, and a pen-knife; on the part of our patients, proper clearing of bleeding surfaces and dressings which will keep them clean, and along with these good ventilation, thorough drainage, and perfect plumbing. Dr. Wright cautioned the profession against pinning their faith to any special antiseptic, thinking that, by simply using this, dirty hands and dirty instruments could be employed with impunity; at the same time he believed that modern antiseptic remedies furnish invaluable assistance in efforts towards asepticism. Dr. Wright then gave the following short account of the methods practised in the Burnside Lying-in Hospital, Toronto. On admis-

sion, the patient is bathed and dressed entirely in clothing belonging to the hospital. When labor comes on, she is clothed in a clean night-dress and drawers. The presentation is made out by abdominal palpation. Vaginal examinations are made in the first stage, occasionally, but as seldom as possible. Each one who touches the patient first washes his hands thoroughly, using soap, nail-brush, and pen-knife, and then rinses them out in a solution of bichloride of mercury, 1 to 1000. This process must be repeated before each examination. When the presenting part is pressing on the perineum, the vulva is protected by a towel which has been soaked in the bichloride solution. After the delivery of the child no vaginal examinations are made; the placenta is expressed by the Dublin method. The assistant keeps the uterus contracted with gentle rubbing with the finger-tips. The soiled clothes are then removed, the nurse washing the vulva with a bichloride solution. No vaginal or intrauterine douche is used either before or after delivery. The antiseptic pad is then applied. Dr. Wright then illustrated the making of this pad, which consists of absorbent cotton, enclosed in butter-cloth; before the dry pad is placed in position a layer of absorbent cotton wrung out of a bichloride solution is placed over the vulva, the pad lying on this. Septicæmia had been exceedingly rare in the Burnside during the last few years, the temperature rarely reaching 100° F.; the patients generally go out in two weeks after labor. Dr. Wright objected to vaginal and intrauterine douches, "because they are unpleasant for the patients, because they interfere with the physiological rest which the torn and bruised parts should have, because septic matter or air may be introduced and brought in contact with rents in the cervix, vagina, or vulva, and, finally, because they are unnecessary." He also laid great stress on the danger of introducing the fingers into the vagina after labor; it is entirely uncalled for in the great majority of cases, the placenta being easily expressed by external manipulations; it is at this stage that septic matter is most readily taken up by the open vessels and the abraded surfaces. He believed that puerperal septicæmia is more frequently caused by absorption of septic matter by the torn fourchette or perineum than from any other source; therefore the practitioner should be careful to avoid this by the use of the antiseptic pads, and cleansing the vulva with the bichloride solution when the pads are changed.

TOXIC SYMPTOMS PRODUCED BY GLYCERIN.

Dr. Jaroschi recently reported to a Prague Medical Society a case which had come under his care of a man who, having been induced by something he had seen in a popular journal concerning the virtues of glycerin to take large quantities of it, soon became seriously ill. He suffered from vomiting, painful defecation, and pain in the calves of the legs. Under suitable treatment, the glycerin being of course interdicted, he was not long in recovering. The etiology of the case is not very clear, but it seems that the glycerin used was bought not from a chemist, but from an oil-shop, as it was cheaper there, and it is said that the glycerin of commerce not unfrequently contains a very appreciable quantity of arsenic; at least, Ritzert, who investigated the matter some time ago, reported that he had found "large quantities" of arsenic in commercial glycerin. As glycerin is now very frequently prescribed for rectal use, and as patients frequently purchase it at oil-shops, it would appear to be important to get the question of its liability to contain arsenic settled, and if any uncertainty be found to exist, it would be well to caution patients to buy their glycerin at a chemist's.—*Lancet*, June 29, 1889.

THE ANTIBACILLIC POWER OF THE BALSAM OF PERU.

Landerer's surprising success in the treatment of tubercular processes with balsam of Peru, led Drs. Bräutigam and Nowack to test the action in pure cultures in different degrees of concentration on various micro-organisms (*Centralblatt für Klinische Medizin*, June 15, 1889). They lay considerable stress in the first place, as to the necessity of having a pure preparation, since there are numerous adulterations of this drug on the market. Their experiments showed that pure balsam of Peru was capable of entirely destroying various micro-organisms within twenty-four hours. In emulsions of twenty per cent. it arrested all development and growth in the different cultures. From the fact, however, that weaker emulsions of balsam of Peru scarcely even delayed the development of bacilli, the authors believe that their experiments prove that the intravenous and intra-pulmonary injections of pure balsam of Peru do not owe their value to any antibacillic power possessed by this remedy; but rather to the prevention of the development and ac-

tion of ptomaïnes. They promise subsequent experiments as to the correctness of this latter supposition.

THE TREATMENT OF DISEASED TONSILS WHEN UNATTENDED WITH HYPERTROPHY.

At the meeting of the Eleventh Annual Congress of the American Laryngological Association, recently held in Washington, D. C., Dr. John O. Roe read a paper with the above title (*Boston Medical and Surgical Journal*, June 27, 1889). The conditions referred to are of marked clinical importance, but their consideration is ignored by writers upon these subjects. The most common form of the disease of the tonsil is hypertrophy, and in children it is rare to find any other form. During adolescence the tonsils may diminish in size, but they do not return to their normal condition. The small tonsils in adults have often followed hypertrophy. This is a point in favor of the removal of enlarged tonsils. The two forms of disease of the tonsil to which attention was called were—first, chronic disease of the crypts and lacunæ; and, second, fibroid degeneration of the stroma of the organ, the cicatricial form of the disease. The first is the result of chronic follicular catarrh of the tonsil, and is usually associated with chronic follicular catarrh of the pharynx. The treatment of these conditions is important, not only on account of the disease itself, but also because they are the source of recurrent trouble, and may cause reflex symptoms. Local applications are practically useless. The galvano-cautery, which is useful in the treatment of hypertrophied tonsil, may be employed here, but is not as efficient as it is in the former condition. The treatment *par excellence* is ablation with the knife. The diseased crypts may be laid open and cauterized with chromic acid or fused nitrate of silver. Excision is, however, the best plan. It is rarely advisable to attempt removal of the whole mass at one time on account of the adhesions to the pillars. The use of cocaine lessens pain and hemorrhage. In every instance in which the speaker had employed excision the cure had been perfect, with entire relief from the attendant symptoms.

In the discussion which followed, several members present referred to the effects produced by the presence of hard masses in the crypts and lacunæ of the tonsils.

SUBCUTANEOUS LYMPHORRHAGIA.

Dr. Neufeld mentions in a Polish journal a few cases which have come under his notice, where, in consequence of some injury, extravasation of lymph from a lymphatic vessel has occurred. Six years ago a man was brought into the hospital who had been struck on the thigh with a large piece of coal. There was no discoloration of the skin, but there was a marked fluctuation over a large portion of the anterior and lateral aspects of the thigh. Some years later another patient came into the hospital who had received a blow on the back; here also there was extensive fluctuation, involving the whole of the dorsal region. With regard to the first case, although Dr. Neufeld suspected from the first that the fluctuating fluid was lymph, he was unable to feel certain of it, and up to that time no description of lymphorrhagia had been published in any of the well-known text-books. As the tumor showed no signs of diminishing after a couple of months, he made an extensive incision into it, thus emptying the sac, after which the wound healed rapidly, without fever. In the second patient the fluid disappeared spontaneously after the patient had been lying on his back for six weeks. A third case is mentioned in which no change took place for six weeks. Dr. Neufeld is disposed to agree with Gussenbauer as to the origin of this accident, and believes that the best treatment consists in laying the sac well open during the first few days.—*Lancet*, June 22, 1889.

TANGHININ.

Under the name "tanghin," a substance was formerly used as an ordeal poison in Madagascar, concerning which little information has been obtained, beyond the fact that it was derived from the seed of *Tanghina venenifera*, an apocynaceous plant. Like other judicial tests of the kind, the drug appears to have been variable in its action: sometimes it quickly produced emesis, and nothing worse befel the person on trial, who was, therefore, considered innocent; at other times it was retained in the stomach, and quickly proved fatal, when the victim would, of course, be held to have been guilty. In exhausting with boiling alcohol the crushed seeds, previously treated with carbon bisulphide, and evaporating the tincture, M. Arnaud has recently obtained a crystalline substance that acts powerfully as a poison (*Compt.-Rend.*, cviii. 1255). The compound,

which has been named "tanghinin," is a cardiac poison, approximating in its action to strophanthin and oubain, but differing in producing a general convulsive action. It is colorless, crystallizes in perfect rhombs, is very slightly soluble in water, more soluble in ether, and freely soluble in strong alcohol. It contains no nitrogen, and, although it is decomposed by acids, no reducing sugar is separated.—*Pharmaceutical Journal and Transactions*, June 29, 1889.

THE USE OF MENTHOL IN THE UPPER AIR-PASSAGES.

At the meeting of the Section on Laryngology and Otology of the Fortieth Annual Meeting of the American Medical Association, DR. F. H. POTTER read a paper on "The Use of Menthol in the Upper Air-Passages," and the results produced by him during the past few years of local application (*Medical Record*, July 6, 1889). These results indicate that the drug controls superficial inflammation; that it is an analgesic, and a second application can be made in increasing strength without discomfort; that it is destructive of some of the low forms of life, especially the bacillus tuberculosis, and that it is a valuable antiseptic in nasal surgery. It has an important place in the treatment of atrophic conditions. It can be used in strength of from one to fifty per cent. dissolved in oil. The oleum petrolia the author considers the best for the purpose of dissolving the drug. It can be applied directly by cotton application, or by means of the spray or by vaporization. The direct method answers best in the pharynx, the spray and vapor for the nose and larynx. Five cases of laryngeal phthisis following upon disease of the lungs were also reported, in which the menthol treatment gave satisfactory results, the local conditions improving rapidly under its use.

DR. CHARLES H. KNIGHT, of New York, also read a paper on "Menthol in Laryngeal Phthisis." Twenty cases, most of them of a severe type, treated with menthol applications, furnished the author ground for believing that this is a valuable agent in tubercular laryngitis. The drug was dissolved in fluid cosmolene in the proportion of a drachm or a drachm and a half to the ounce, and applied by means of a laryngeal syringe, or in the form of spray, by a nebulizer or vaporizer. In nearly all cases the subjective symptoms and the local appearance improved. In n case did complete healing of an ulcer tak place. In this respect the author's experi ence does not bear out the representations o Rosenberg and others. Three propositions are offered: 1, spontaneous cure of a tube cular ulcer of the larynx may occur; 2, simple erosion or ulceration may be mistake for a tubercular ulcer; 3, the best result from local treatment of the larynx may b expected in cases of incipient or limited pul monary disease and in primary laryngea tuberculosis.

HYDRACETIN.

It will be remembered that a few month ago (*Pharm. Journ.*, December 1, p. 425 under the name of "pyrodin," a new prepara tion was introduced as an antipyretic, experi ence with which called forth repeated cautio as to its toxic action. The preparation was re resented as having for its active principle ac tylphenylhydrazin ($C_6H_5NH—NH.C_2H_3O$) but, according to one statement, it only re resented one-fourth of the activity of that co pound. More recently the pure acetylpheny hydrazin has been introduced in Germa under the name "hydracetin," and has be reported upon somewhat favorably by D GUTTMANN (*Pharm. Centralbl.*, May 16, 311; May 30, p. 341). According to Dr. Gut mann, hydracetin exercises a powerfully an pyretic action in relatively small doses, and also effective in relieving rheumatism of t joints. The doses given ranged from 5 20 centigrammes in the day, and in only few cases to 30 centigrammes; the dose re ommended is 10 centigrammes, given two doses of 5 centigrammes daily. It expressly stated, however, that its intern administration must be cautiously conducte and must not be continuous. Hydracet occurs as a white, odorless, and almost tast less crystalline powder, soluble in fifty pa of water, and freely in alcohol. It reduc alkaline cupric solution immediately in t cold, and precipitates metallic silver from alkaline silver solution. Mercuric salts a converted by it into mercurous salts, qui rapidly upon warming, and ferric salts in ferrous. In a mixture of solution of pota sium ferricyanide and dilute solution of fer chloride, the addition of hydracetin produc an immediate precipitation of Berlin blue; also decolorizes solution of potassium pe manganate, and reduces platinic chloride metallic platinum. Its powerful reducing a

tion is considered by Dr. Guttmann to stand in relation to its antipyretic and anodyne properties, and he states that he has also used it with success as an outward application in psoriasis in the form of a ten per cent. ointment.—*Pharmaceutical Journal and Transactions*, June 29, 1889.

THE TREATMENT OF THE ACUTE STAGE OF ECZEMA.

In the *Practitioner* for July, 1889, DR. D. MACKINTOSH publishes some suggestions as to the treatment of the acute stage of eczema, which he claims will speedily arrest the inflammatory stage of the disease, and put an end to perhaps months or years of future suffering.

In the treatment of the acute stage of eczema two essentials must be reckoned with before we proceed to tackle the disease itself. The first of these is, that the patient must be instructed not to wash the eczematous parts, and this advice he must religiously observe. He will probably reply, "But I must wash sometimes." "Wash not at all," is the first commandment in eczema. He must neither wash with, nor yet without, soap, nor with the usual adjuncts of bran steeped in hot water, oatmeal, milk and water, buttermilk, whey, sour milk, or rain-water, or any other of the usual washes; all of these are mistakes that seriously hamper and delay curative treatment. That persistent washing predisposes to eczema by drying the skin, and depriving it of the unctuous secretions which impart to it suppleness and softness, qualities on which the natural beauty of the complexion so largely depends, there cannot be a doubt. For the same reason and in the same manner, although it is not generally known, frequent washing with soap and water is disastrous to the growth of hair, it changes its natural color to a lighter hue, the natural gloss is lost, the hair becomes dry, prematurely gray, and early baldness is favored. This process of destruction is materially hastened by washing the head with warm or hot water and soap during cold weather. The head and beard should be dressed and kept clean by combing and brushing, a process all-sufficient for purposes of cleanliness, and the rational method for preserving a fine head of hair.

In eczema of the head and face the more essential parts to wash, such as the corners of the eyes and angles of the mouth, may be touched lightly with a small piece of soft ——ge, made damp with cold water, and immediately dabbed dry. Warm and hot water should be discarded in the neighborhood of the eczematous skin. A patient suffering from eczema of the head and face only may, of course, sponge and wash his body with warm water as frequently as necessary. Coffee, strong tea, and alcoholic drinks should be forbidden.

The second essential is that the bowels be kept well open. In the case of children, gray powder, rhubarb, and bicarbonate of sodium, a grain of each, taken as required every second or third night, will answer every purpose; or gray powder and magnesia will do equally well. In adults, saline medicines hold the first rank. The following is a useful combination:

℞ Magnesii sulphatis, ʒvi;
Sodii bicarbonatis, ʒi;
Infusum gentianæ co., ad ℥vi.
Sig.—Take a sixth part three times a day before meals.

The author claims that the sulphate of magnesium is far and away the best of all purgative medicines in most other diseases as well as in eczema,—the best because the mildest, the least irritating, one of the least injurious, and certainly one of the most effectual; but it must be taken at the proper time and in the proper quantity. The proper time is an hour before meals, preferably in the morning before breakfast, although it may be taken before any other meal with nearly equal benefit. The proper quantity is 3 drachms, dissolved in three parts of a tumblerful of cold water or soda-water. Hot water does not materially help its action, and it makes the drug more nauseous. 3 drachms of sulphate of magnesium, dissolved in an ounce of chloroform-water, followed by a cup of tea or beef-tea, can be swallowed almost without taste or inconvenience. A 4- or 5-grain blue pill taken at night, and the same draught next morning, has its advantages; or, what is perhaps better still, where free purgation is desired, the following pill at bedtime, and the draught in the morning:

℞ Extracti colocynthidis co., gr. iii;
Pilulæ hydrargyri, gr. i;
Extracti hyoscyami, gr. i.
Ft. pil.

Where there is torpidity of the liver, a combination of cascara with nux vomica is equal, if not superior, to any other:

℞ Extracti cascaræ sagradæ liquidi, ʒiiiss;
Tincturæ nucis vomicæ, ʒi;
Glycerini, ʒiii;
Infusum gentianæ co., ad ℥viii.
Sig.—Take one ounce every evening directly before dinner, or morning and evening if required.

Medicines, such as arsenic and iodide of potassium, given internally, are disappointing, and of very little use. Of course, gouty eczema must be suitably treated.

The great desideratum is the appropriate external treatment. Dr. Mackintosh gives the following as an ointment which in most cases pretty nearly approaches the character of a specific:

℞ Bismuthi subnitratis, ʒiv;
Zinci oxidi, ʒi;
Acidi carbolici liquidi, ʒss;
Vaselini albi, ʒii.
Ft. ung.

Or

℞ Bismuthi subnitratis, ʒii;
Zinci oxidi, ʒss;
Glycerini (Price's), ʒiss;
Acidi carbolici liquidi, ♏xx;
Vaselini albi, ʒvi.
Ft. ung.

The latter ointment mixes into a beautiful enamel-like cream, which is cooling, and acts as a balm to the irritable skin.

When constant tingling and irritation disturb the patient's rest at night, this lotion is said to be invaluable:

℞ Bismuthi subnitratis, ʒi;
Glycerini (Price's), ʒiv;
Acidi carbolici liquidi, ♏xii;
Aquam rosæ, ad ʒi.
Sig.—Shake up, and apply with a camel's hair pencil.

During the day, when business has to be attended to, and the ointment cannot be applied, a powder will be found useful:

℞ Cimolite,
Bismuthi subnitratis,
Zinci oxidi, aa partes æquales.
Fiat pulvis.

In more chronic cases the famous *Unguentum metallorum* still holds its own. It consists of

Unguenti zinci,
" plumbi acetatis,
" hydrargyri nitratis, aa partes æquales. Misce.

This ointment may be varied by substituting white precipitate for the nitrate of mercury ointment.

TREATMENT OF WHOOPING-COUGH.

In the *Revue Mensuelle des Maladies de l'Enfance* for July, 1889, Dr. O. Mugdan reports the results of treatment of whooping-cough in Dr. Baginsky's clinic with resorcin, antipyrin, cocaine, and insufflations of different powders through the nose.

1. *Resorcin.*—Moncorvo was the first to employ resorcin in whooping-cough. Starting with the idea that whooping-cough is an infectious catarrh, produced by micro-organisms which are located especially on the laryngeal mucous membrane below the vocal cords, this author was led to employ a solution of resorcin by means of the spray, first employing a one or two per cent. solution, and finally an eight per cent. solution. In Baginsky's clinic resorcin has been employed in the form of sprays, and given internally, but without any appreciable result. In eight children in which a one or a one and a half per cent. solution was given every two hours, in not one was there the least relief obtained through this treatment. Consequently, if these results are accepted, the internal administration of resorcin is totally valueless. According to the researches of Afanasieff, the tendency is to admit that the bacillus of whooping-cough, so far from being located exclusively on the laryngeal mucous membrane, in the neighborhood of the vocal cords, invades all the respiratory mucous membrane, and particularly that of the bronchii and nasal fossæ. In these conditions inhalations of a solution of fifteen or twenty per cent. of resorcin might perhaps give appreciable results.

2. *Cocaine.*—Spraying with cocaine was first employed by Prior, who, with a five or ten per cent. solution, in this way anæsthetized the pharynx and posterior wall of the larynx and the inferior surface of the vocal cords. The good results of this method of treatment have been confirmed by a large number of authors, among others Pott, Carr, Barbillion. On the other hand, Moncorvo, Hagenbach, and Henoch have contested the efficacy of this mode of treatment. In eleven cases under the care of Dr. Baginsky submitted to this treatment, the number and intensity of the attacks have been favorably modified in the majority of cases; but, nevertheless, the author is of the opinion that this mode of treatment should not be employed on account of the great resistance which most children offer to it, and on the frequency of the symptoms of poisoning which follow the employment of this treatment in many cases.

3. *Insufflation.*—Michael, considering whooping-cough as a reflex neurosis from the nose produced from irritation by the specific poison of whooping-cough, recommends the employment of insufflation of boric acid

and quinine, and later benzoic acid, in the nasal fossæ. The results which he has obtained, however, have not been satisfying. About the same time, Guerder made insufflations with equal parts of boric acid and powdered coffee, and his results were quite as good as those of Michael. Bachem, Hagenbach, Stœrk, and Lublinski have likewise recognized the good effects of this mode of treatment, while Genser alone claims that these insufflations have no effect on the progress of the disease. In Baginsky's clinic Dr. Mugdan gives notes of twenty-five cases which were submitted to methodical insufflation with benzoic acid; of these, seventeen showed marked amelioration after the very first insufflation, and a cure was generally obtained within one to three weeks.

4. *Antipyrin.*—Recently antipyrin has been employed in whooping-cough, and most physicians who have experimented with this agent have obtained favorable results. In Baginsky's clinic, however, it is stated that the results were negative in all the cases treated by antipyrin under the method of Sonnenberger, who recommends the administration of three or four times daily of one-sixth grain for every month of age of the child, or two grains per every year of age. In seven cases treated after this method neither the intensity nor the number of the attacks showed any modification. Further, this remedy is by no means innocuous, and reports of poisoning with it are rapidly accumulating on all sides.

THE TREATMENT OF PRURITUS WITH MENTHOL.

The analgesic properties of this substance have been utilized to diminish pruritus in various skin-affections, and especially senile pruritus, the pruritus of eczema, that of the itch, and in urticaria. In the *Gazette Hebdomadaire de Médecine et de Chirurgie*, June 21, 1889, DR. ELOY gives the following formulæ for the tincture, liniment, and ointment of menthol.

1. *Tincture or Spirit of Menthol.*—

Menthol, 1 to 3 parts;
Forty per cent. alcohol, 50 to 60 parts.
For external application.

2. *Liniment of Menthol.*—This preparation appears to have a more durable action than the preceding. Its formula is as follows:

Menthol, 3 parts;
Olive oil, 30 parts;
Lanolin, 30 parts.

3. *Ointment of Menthol.*—The ointment, according to the formula of Saalfield, has the following composition:

Menthol, 2½ parts;
Balsam of Peru, 5 parts;
Lanolin, 100 parts.

In certain cases it may be necessary to increase the proportion of menthol in the above preparation up to ten or fifteen per cent. of the excipient when the pruritus is very rebellious, especially when it occurs in chronic eczema.

THE VALUE OF THE KOLA NUT.

In the *Practitioner* for July, 1889, SURGEON R. H. FIRTH published a series of observations made at the Mian Mir Camp of Exercise during January, 1889, which was a continuation of a similar series conducted at Umballa during January, 1888. He formulates the following conclusions as the results of this series of observations:

1. That kola nut is in no sense a food; it is to be regarded purely as a drug.

2. That its physiological action upon the human economy is to increase the total urinary water, with a slight reduction of its total solids and a marked reduction of the extractives eliminated by the urine. Such action is probably due to its contained caffeine, which favors increased oxidation of the tissues. It in no way affects the nitrogen output of the body.

3. That kola nut, when pure and not too old, has a peculiar stimulant action on the nervous system, temporarily strengthens the heart-beat, and increases the arterial tension. Taken continuously during times of exertion and fasting, it possesses some power of warding off the sense of mental and physical depression or exhaustion peculiar to that condition; this power is not, however, so marked as some observers have reported.

4. That it might be employed on service as an issue to troops in the form of broken-up nuts, the same being issued with instructions that a piece be constantly kept in the mouth and chewed, and the saliva swallowed. The facts being made clear to the men that, though not in themselves a food, yet, from certain qualities inherent in them, the nuts guard against exhaustion, and moreover have a salutary action upon the lining membrane of the mouth, stomach, and intestines, rendering them less susceptible to the action of

indifferent food and water. Owing to the uncertainty of the action of kola nuts, and the great difficulties to be overcome in combating the prejudices of soldiers towards any new and unfamiliar article such as these nuts are, any issue of kola nuts to troops by government should at first be upon only a limited scale, as neither our present knowledge regarding them nor the results of their trial justify any large outlay.

5. That as an infusion with milk and sugar kola powder is an efficient substitute for tea or coffee, being especially for those affected with diarrhœa superior to either owing to its astringent action.

6. That as a therapeutic agent in the convalescence from long sickness its value is not apparent.

7. That its alleged antagonistic action to alcoholic sequelæ is not capable of proof.

8. That as a purifier of water its action is purely mechanical, and not superior to that of the *Strychnos potulorum* or other mucilaginous seeds.

9. That any consigment of kola nuts bought for government for issue to troops needs most reliable supervision, in order that none but the seeds of the true or "female kola" are issued, and that spurious seeds, such as those of *Garcinia kola* or "male kola," and *Sterculia cordifolia*, species which contain no caffeine, are not issued in mistake for the true nut.

10. That while the nut powdered and made into an infusion with boiling water is an agreeable way of taking kola; yet the nut should be always freshly ground, and this method is inferior to continual mastication of the solid nut for dietetic emergencies. Those chewing the nut must do so continuously, keeping it in the mouth all day, and swallowing the saliva if any satisfactory effects are to be attained.

CREOLIN ECZEMA.

In the *Therapeutische Monatshefte* for June, 1889, Dr. J. Wackez states that, led by the statements as to the innocuousness of creolin, he employed it in seventeen cases of incised and lacerated wounds occurring in children, in ten of whom union by primary intention occurred, while in seven more or less severe eczema occurred. The skin in the neighborhood of the wound on the second day of the creolin treatment became markedly reddened, almost resembling an eruption of scarlatina, with severe itching. On the third day numerous vesicles formed, filled with clear fluid, and attained the size of from a quarter to half a dollar. The temperature was elevated, the neighboring lymphatic glands swollen, with loss of appetite, headache, and frequent vomiting. On the third day after the vesicles had been emptied, either spontaneously or artificially,—a process which is accompanied by the profuse excretion of serum,—the epidermis pealed off in large flakes, and a condition similar to that of a burn of the second degree resulted. From the scratching, which was the consequence of the severe itching, other parts of the body were likewise affected, and vesicles appeared on the face or hand, as a consequence of contact with the effused serum. From the fact that no other antiseptic than creolin was used, and that in the dilution of 1 to 1000, the conclusion is warrantable that creolin itself was the cause of the eczema. From the fact that there was alteration in the general health of the patients who were subjects of these attacks of eczema, the urine was subjected to chemical examination, and showed elimination of phenol and an increase in the aromatic etherial sulphuric acid compounds. These results would appear to show that creolin is by no means an absolutely harmless substance, and should not be employed for children without hesitation. Nevertheless, even in these cases of Dr. Wackez, rapid cure of the wound is stated to have taken place even in spite of the occurrence of eczema.

HYSTERIA AND MERCURIAL POISONING.

In his lectures at the Necker Hospital, Dr. Rendu presented a patient, 38 years of age, admitted ten days before with incoordination of motion, marked trembling of all the limbs, but especially of the lower extremities, so that the least movement brought on decided oscillations. At the present time the movements cease when the patient lies in bed, but the least attempt at motion, even in the recumbent position, brings on quite intense trepidation. Flexion produces more spasm than extension. The trembling is characterized by large oscillations, and not by small ones, as in alcoholic intoxication. The muscle itself has an exaggerated tonicity, and the slightest percussion determines an extended reflex upon the neighboring muscles, showing the existence of a peculiar condition of the spinal cord, and since, lying in bed, he can execute all movements which he is told to with suffi-

cient force and without the least exaggeration, the condition is not one of true ataxia, though in walking the limbs are thrown about just as in the latter disease, and if the eyes are closed while upon his feet, he falls at once. Troubles of sensation are also present, such as fulgurating pains in the lumbar region radiating towards the upper parts of the thighs, in the region of the knee-joints radiating towards the malleoli, etc. Even if this were a case of ataxia it would not be one of tabes, since the tendon reflex, far from being suppressed, as in ataxia, is exaggerated, and, besides the trembling, has not the character of that of ataxia. In pseudo-tabes there is a tendency to peripheral lesions of nerves more than to a spinal state. It is met with especially in alcoholics, in infectious diseases, lead and oxide of carbon poisoning, in hysterics, and is always accompanied by a certain degree of paresis and diminution of force. In alcoholic pseudo-tabes the patients complain generally of persistent pains in certain groups of muscles, notably in those of the calf, and there is almost always a diminution of the tendon reflex. Spasmodic tabes is a rare affection, analogous to this case, but showing also muscular paresis and contraction here absent. The peculiarities of this case are that the trembling began in the lower extremities, that the head has not been affected, and that this man has had no loss of power, contrary to what usually happens in mercurial poisoning. In looking into the antecedent history, we find that the patient is a well-recognized hysteric, who has been treated by Charcot at the Salpêtrière, having had hemiplegia with complete sensory and sensitive anæsthesia at one time, and paraplegia of both lower extremities and general anæsthesia at another. At the same time, however, he is suffering from the effects of mercury upon the system, and it is well known how this metal has an influence to bring forth hysteria in men. Up to the age of twenty-seven this man was well; he then began to work in the manufacture of hats, being exclusively employed in preparing rabbit-skins, in which, as is well known, nitrate of mercury is used.

Within a year the system became impregnated with the mercury, and trembling of the legs began. After three months' hospital treatment he went back to work, but within two months became salivated, and since that time the trembling of the legs has never ceased.

Treatment has consisted in an evening dose of 2 grammes (30 grs.) of bromide of potassium and a morning dose of 30 drops of tincture of valerian. Besides this, he has had hydrotherapy, and, if improvement is not satisfactory, prolonged baths and the continuous current of electricity will be used.—*Journal of Cutaneous and Genito-Urinary Diseases*, August, 1889.

ASEPTIC AND ANTISEPTIC SURGERY.

At the recent annual meeting of the Massachusetts Medical Society, DR. H. L. BURRILL, of Boston, read a paper on this subject, in the Section in Surgery (*New York Medical Journal*, July 27, 1889), in which, remarking upon the great value which the new science of bacteriology was destined to have with reference to the department of practical surgery, he proceeded to describe in detail a number of experiments conducted by himself and Grenville R. Tucker, which were intended to show by what methods, and by the use of what chemical agents, the various instruments and the separate steps in operative surgery might be rendered practically aseptic.

1. As to the preparation of the room for an operation, he said that all movable objects should be removed; then the room should be carefully swept and dusted, and the walls sponged over with a sublimate solution (1 to 1000). In emergency cases nothing should be disturbed.

2. As to the toilet of the surgeon and his assistants, their hands should be washed according to the usual methods,—viz., soap, nail-brush, etc., then immersed in ether, then in corrosive sublimate solution (1 to 1000).

3. As to the preparation of the operative field, it should be shaved if necessary, scrubbed with soap and water, and then washed with ether and corrosive sublimate (1 to 1000).

4. As to the sterilization of instruments, Dr. Burrill concluded that of all methods, that of baking the instruments in an oven at a temperature of from 140° to 160° C. was the best. A higher temperature injured them. Needles should be subjected to a similar process.

5. As to the disinfection of sponges, steaming caused great shrinking; the most satisfactory method, attaining at the same time to wellnigh perfect sterilization, consisted in washing sponges in running water again and again, then placing them in a solution of permanganate of potassium for twelve hours, then washing them in oxalic acid, then wash-

ing, then placing in carbolic acid (1 to 40) in jars, and storing for future use.

6. As to ligatures, they should be taken from original bottles, wound upon glass spools, and placed in a solution of corrosive sublimate (1 to 1000) in a bottle specially designed by Mr. Tucker.

7. As to irrigation, corrosive sublimate (1 to 4000) was most satisfactory.

8. As to the dressings, to render them aseptic, they should be taken in the shape of bleached gauze, and subjected to a temperature of 150° C., then saturated with a ten per cent. solution of glycerin, then dried. Thus treated, they were possessed of marked absorbent properties, excelling in this respect all other dressings.

In conclusion, the author urged the importance of putting these methods into practice, and, though he admitted the difficulty of absolute sterilization, yet it was possible to approach very closely thereto. Every surgeon, he thought, should operate with thoroughly cleansed hands, with thoroughly cleansed instruments, upon a thoroughly cleansed patient.

In the discussion which followed, DR. J. C. WARREN, of Boston, remarked upon the ill effects oftentimes arising from a too free use of the so-called germicides in efforts to procure asepsis. The safety of drugs in this respect was inversely proportional to their power as germicides. Boric acid, for instance, was perfectly safe, yet had no antiseptic action whatever, as it was used in ordinary wounds. He could not advise too strongly against a too lavish use of antiseptics in the dressing of wounds. He cited a case of carbolic acid poisoning in a patient suffering from slight burns of the hands and face, which had been treated with carbolized vaseline (1 to 40). Since having a patient suffer from high temperature, insomnia, and then delirium, because of a too generous use of iodoform in powder after an operation for proctocele, he had ceased using it, preferring the gauze instead. He did not mean to convey the idea that he looked with disfavor upon antisepsis. He would always use germicides with a view of equalizing the equation of personal cleanliness, and of counteracting the general tendency to dirt in patients. Something more was needed than simple soap and water.

The speaker referred to the series of experiments by Watson Cheyne, which tended to prove that different portions of the body were possessed of different powers of resistance to the influence of infection of bacteria and micrococci: for example, the peritoneal cavity was remarkably tolerant of the action of bacteria or septic materials, and did this not explain the success attending surgeons in their operations in this region, where no antiseptic precautions whatever were taken? Other places more cellular in structure were less tolerant, and disregard in taking antiseptic precautions would show correspondingly bad results in operations.

DR. A. T. CABOT, of Boston, remarked that the chief use to be made of antiseptics was in the way of preparation,—preparation of the hands, sponges, instruments, and surface to be operated on. This being done we could proceed much as surgeons used to —with care that the instruments did not come in contact with objects not previously disinfected. He said that the two agents most promotive of putrefaction, and thus of poor results in operations, were (1) moisture and (2) heat. The former could be largely done away with by proper attention in applying the dressings. All blood should be scrupulously sponged out before closing the wound; a drainage-tube should be properly introduced, and then firm pressure made and kept up while the outside bandages were being arranged, and in this manner prevent the filling up of the wound with blood and serum. It was often desirable to sew the deeper parts of a wound together so that healing by first intention might result. As to the use of iodoform, boric acid powder, etc., he believed that the explanation of their favorable action on wounds and suppurating surfaces was to be found in their drying qualities. Dressings should always be dry and have great absorbent power. When impregnated with these powders, they possessed these qualities to a marked degree, and so kept the wound dry and promoted rapid healing. If he were compelled to abandon either antiseptic washes or dry dressings, he would unhesitatingly give up the former.

EFFECTS OF PROLONGED CHLOROFORM ANÆSTHESIA.

Some observations made about two years ago by Dr. Ungar pointed to fatty degeneration of the heart and liver as the cause of death after repeated prolonged administration of chloroform. Further experiments on dogs have recently been made by DR. STRAMAN, which appear to confirm this view. 1

Strassman found that the first organ to be affected was the liver, then the heart, and after that other viscera. The nature of the morbid change was not a fatty degeneration, but fatty infiltration. The actual cause of death in fatal cases appeared to be the cardiac affection, as in all such a very marked degree of change was found in the heart. In non-fatal cases the morbid change was found to have disappeared in a few weeks' time. When morphine was given previously to the chloroform, less of the latter was required, and consequently the changes produced were not so considerable as when the ordinary amount was given. Animals suffering from hunger, loss of blood, etc., were especially predisposed to the morbid changes due to chloroform.—*Lancet*, July 20, 1889.

THE TREATMENT OF INTESTINAL OCCLUSION WITH ELECTRICITY.

At a meeting of the French Academy of Medicine, M. HÉRARD presented a report on the essay of M. Larat as to the treatment of intestinal occlusion with electricity. In twenty-four cases the author claims that he has obtained ten complete cures and six incomplete cures, in the sense of removal of intestinal occlusion; although in the latter cases death occurred, whether from exhaustion, peritonitis, or some organic lesion. The fact is further recalled that M. Boudet in similar cases was rewarded by seventy per cent. of cures.

Faradization is indicated by acute strangulation, while galvanism is said to be indicated in slow occlusion with paresis of the intestine. For convenience induced currents may be associated with success. The electrolytic action of the galvanic current may be avoided by disseminating the current through the aid of an enema of salt water.

In the discussion which followed the announcement of these results, M. LE FORT was of the opinion that electricity might give favorable results in obstinate constipation, but in cases of true obstruction or invagination its therapeutic action was much more uncertain.

M. CONSTANTINE PAUL, on the other hand, claimed that galvanization was almost always followed by success when the obstruction was located in the large intestine; but, if its seat was in the small intestine, and if an invagination was present, he believed that it would be very dangerous to cause contraction of the intestinal tube upon an immovable mass.

M. HÉRARD stated that in his experience invagination was much more common in the large intestine; nevertheless, faradization might succeed in invagination of the small intestine. He believed, however, that it was impossible during life to form an absolute diagnosis.

THE ETIOLOGY OF TYPHOID FEVER.

At a recent meeting of the American Medical Society, held in Newport, R. I., DR. V. C. VAUGHAN, of Ann Arbor, Mich., read a paper on the "Etiology of Typhoid Fever," in which he claims to have detected a chemical poison in the dejecta of patients suffering with this disease, which appears to be of the nature of a ptomaïne (*Boston Medical and Surgical Journal*, July 18, 1889). Dr. Vaughan refers to the researches of Professor C. J. Eberth, of Zurich, who, in eighteen out of forty-eight cases of typhoid fever, found in sections of the spleen and mesenteric glands a bacillus, which was distinguished from the ordinary putrefactive bacilli by the difficulty with which it took up the aniline stains. At the same time Eberth reported that in twenty-four similar examinations of those dead from other diseases, he was unable to detect this bacillus, and from these facts thought himself entitled to claim that he had discovered the true germ of typhoid fever. Since that time various experiments had been made by many different observers. The attempts which had been made to induce the disease in the lower animals by inoculation with this germ were numerous and interesting.

To sum up the evidence which we had upon this point, we might say: 1, the Eberth germ was found invariably in the bodies of those dead from typhoid fever; 2, it had been isolated, and grown in pure cultures; 3, all attempts to induce typhoid fever in the lower animals by inoculation with this germ had thus far been without success; 4, experiments showed not only that the germ failed to multiply in the lower animals, but that when introduced by inoculation it soon died.

Dr. Vaughan thought it was now time to add this rule to the four rules of Koch: Before any micro-organism could be considered the true and sufficient cause of a given disease, it must be shown that the chemical products of that germ were capable of producing the characteristic symptoms and lesions of that disease in an acute form. Did this

germ produce any chemical substance which would markedly elevate the temperature, such as mydaleine, or any which induced local inflammatory and necrotic changes in the tissues, such as cadaverine or putrescine? We could not say that the Eberth germ had been demonstrated to be the true and sufficient cause of typhoid fever, judging from the failure of the attempts of Brieger in investigating the nature of typhoid poison. To sum up the results of experiments on this point: 1, the result obtained from injections of the Eberth germ was found to be in direct proportion to the amount introduced; 2, that the Eberth germ did not multiply in the blood; 3, the same symptoms and lesions were obtained by the introduction of non-pathogenic organisms. To this the bacteriologist might reply that the lower animals did not have typhoid fever. If we could experiment with man the result would be different.

Dr. Vaughan then described his own experiments in attempting to discover a chemical poison excreted by the Eberth germ. He took the fæces of typhoid patients, from which he obtained these germs. The germs were cultivated. His next step was to obtain a chemical poison, which he succeeded in isolating. Crystals of this ptomaïne were injected over the abdomen of an animal, with resulting fever, severe purging, etc. This ptomaïne was found to be most abundant when the culture was kept at about 104° F. Dr. Vaughan had not completed his series of experiments, and therefore had no definite statements to make respecting this alkaloid, to which he had not as yet given a name.

In the discussion which followed, Dr. W. H. Welch, Baltimore, agreed with the conclusions the reader had drawn from the experiments which investigators had made as to the pathogenic qualities of this typhoid bacillus in animals, but he protested against the setting up of a condition as essential for demonstrating the dependence of an infectious disease upon a micro-organism. He thought we were justified in considering that a germ was the cause of a disease when we found that germ invariably present in the disease in situations which would explain the symptoms of the disease, and when we failed to find that germ in any other circumstances than in that disease. If Dr. Vaughan's condition was to be accepted, he did not know that there was a single disease which had been proven to be dependent upon a micro-organism. It was uncertain whether all micro-organisms which were pathogenic produced their effects by means of chemical substances which they formed. Doubtless that was true of some, but we were not justified in assuming that it was the sole method. He believed the evidence was conclusive that the typhoid bacillus was the cause of typhoid fever. It was a peculiar organism, which was found invariably, if we examined at the proper stage of the disease, in persons sick or dead from typhoid fever. It was found in the situations where we would expect the organism to be found, and had never been found in other situations, except in infected localities as in drinking waters, etc. The isolation of the ptomaïne in a crystalline form from the stools of typhoid fever patients was a very interesting addition to our knowledge, but it would be necessary to make investigations with other stools not infected with typhoid fever before concluding that the ptomaïne had anything to do with the symptoms of typhoid fever.

Dr. James Tyson, of Philadelphia, said with regard to the fact that a chemical product must be discovered in the blood or tissues of the animal, he would say nothing but it seemed to him perfectly reasonable to expect that the same organism which had been found in the animal originally affected should also be found in the blood or tissues of the one in which the disease had been reproduced. That was the accepted original idea. It seemed to him that it would be very much more conclusive proof if we found the organism in the individual secondarily affected, that it was the cause of the disease, rather than if we simply found it in the individual primarily affected.

Dr. V. C. Vaughan, in closing the discussion, said that Dr. Koch, in a conversation with him recently, had expressed the opinion that the Eberth germ had not been demonstrated to be the cause of typhoid fever. Koch had laid down four rules: before we could say that any germ was the cause of a given disease we must (*a*) find it in every case of that disease; (*b*) isolate it from all other material; (*c*) healthy animals of the same species inoculated with that germ must have that disease; (*d*) in the animals inoculated with this disease the germ must grow and reproduce itself. Where these rules had been complied with, there could be no possibility of doubt about the germ being the cause of the disease. Dr. Welch asked would give up every one of these rules save the first, and that we must say that a germ

the cause of a disease when we found it in every case of that disease. Germs depended on the conditions surrounding them. As long as the bacillus of tuberculosis was found in every case of consumption and in no other disease, and no consumption had been produced in healthy animals by it, he claimed he would have had just as much right to say that it was the result of the consumption as they would have to say it was the cause. The proof was not and could not be complete until that germ was isolated from all other material and healthy animals inoculated with it had consumption. Simply because the Eberth germ was found in every case of typhoid fever could not be a proof that it was the cause of typhoid fever. He did not mean to say that every germ produced its deleterious effects by means of its ptomaïne, but did mean to say that this had been demonstrated for a number of diseases,—for anthrax, tetanus, etc.

INHERITANCE OF SYPHILIS.

According to the Paris correspondent of the *Lancet*, July 20, 1889, PROFESSOR FOURNIER delivered an interesting lecture on the "Inheritance of Syphilis," considering the question from the point of view of a threefold interest:

1. *The Scientific Interest.*—In this connection several important points at once appeared worthy the serious attention of medical men. In the first place, Is syphilis hereditary? If so, does it pass down through the medium of the father or mother, or both? At what stage and up to what length of time is syphilis capable of exercising its hereditary influence, and then what power have treatment and time over its career?

2. *The Practical Interest.*—Can one weaken or eradicate this hereditary influence? When and under what conditions can a man who has contracted syphilis be permitted to marry? What about treating a syphilitic who is pregnant, or a woman who has conceived through the medium of a man who is known to be a syphilitic? Is one justified in allowing a healthy nurse to run the risk involved in suckling the offspring of syphilitic parents?

3. *The Social Interest.*—In the face of the enormous mortality following in the train of syphilis, this is by no means the least of the interests attaching to this "factor in depopulation." Its effects amount, indeed, to a veritable social calamity, and, this being so, does not the matter call aloud for some effectual social prophylaxis? Thus, then, without insisting further, it would be conceded that the question of syphilitic heredity was one well worthy the study of the *savant*, the physician, and the hygienist, by reason of its multiple and varied consequences,—consequences highly interesting and in not a few aspects capital.

Professor Fournier next defined in detail what he meant should be understood by heredity in a strictly medical sense, and which differed from the ordinary acceptation of the term where the word was made to include such diseases as the gouty diathesis and smallpox, which latter may have been contracted during pregnancy by the mother and transmitted to the fœtus. In the same way syphilis contracted during pregnancy by the mother and transmitted to the fœtus was classed as hereditary. But this was not what he meant by hereditary syphilis. The differences, clinical and otherwise, between true hereditary syphilis and syphilis by intrauterine contamination were well defined. True hereditary syphilis was that which was transmitted at the moment of conception to the embryonic elements by one or other of the parents in whom it was pre-existent. It was, he urged, clear that a disease which was born with the germ, which made part of it, and which affected it from its very origin, ought to be distinguished from a malady which was contracted by the fœtus already more or less formed and advanced in development. And, as a matter of important fact, observation and experience unite in showing that veritable hereditary syphilis is infinitely more grave and more deadly to the fœtus than the syphilis which is transmitted to it in any of the subsequent stages of its intrauterine life. For the present he was concerned with the true variety only. To begin with, he would not try the patience of his hearers by bringing forward proofs of the existence of true hereditary syphilis. This, he opined, was generally conceded. How, then, it may be asked, do the influences of hereditary syphilis manifest themselves? By manifestations essentially multiple and varied,—infinitely more varied and more multiple than are commonly believed or are traced, especially in the schools of pathology and morbid anatomy; but, although numerous, it is still possible, for practical purposes of exposition, to arrange them under five heads, and, according to the learned lecturer, they may be grouped as follows: 1, accidents of

syphilis, properly so called; 2, fœtal cachexia, ending one way or another in physical degeneration; 3, dystrophic troubles, general or partial; 4, congenital malformations; 5, morbid predispositions. As regards the first, they appear in order, although the sequence may vary; the infection may manifest itself *in utero*. More commonly, it makes its appearance some weeks or months after birth; the former he terms fœtal syphilis, the latter infantile syphilis. More rarely, it may be not only latent at birth, but latent during the first years of life, not entering the stage of apparent evolution until the fifth, tenth, fifteenth, or twentieth year. But, contrary to the opinion commonly held, true hereditary syphilis does not make its appearance by manifestations of the syphilitic order exclusively. It shows itself not unfrequently in a variety of ways,—lesions and symptoms which, although they may not have the ordinary aspect or syphilitic stamp, are not less the undeniable consequences of syphilis. Professor Fournier went on to say that one of the convictions most firmly fixed in his mind, after long study and observation, was that syphilis is not a disease with symptoms and lesions such as are usually accepted as syphilitic only, but that it is a disease, as he puts it, of the whole being, which, by the general reaction it exercises on the organism, is capable of exciting, side by side with the symptoms or manifestations proper, others of another order, which are no longer syphilitic in the ordinary sense, although indirectly derived from syphilis, and which he proposes to term "parasyphilitic." It is thus that one so frequently sees the following manifestations of hereditary syphilis from time to time, which may be put under the foregoing head:

2. *Fœtal cachexia*, or veritable vital degeneration of the fœtus, manifesting itself either by the premature death of the fœtus or the birth of infants wretchedly puny and miserable,—veritable abortions, awaiting early death; or, again, by the birth of others apparently more robust, but in reality of a vital resistance so feeble that a goodly number of them die of the least incidental trouble, and others of no assignable cause.

3. *Dystrophic Troubles.*—In this category he puts some curious examples of retarded and arrested development,—such as slowness of general growth; the appearance of the teeth and locomotive function; retarded puberty and virility, so that very frequently examples were met with of persons of eighteen and twenty years of age who were yet children. What is termed "infantilism," then, is one of the traits which compose the physiognomy of hereditary syphilis.

4. *Congenital Malformations.*—His own opinion was quite in accord with that of Professor Lannelongue and others, which attributed to syphilis of the true hereditary type the origin of the divers congenital malformations,—such as malformed limbs, club-foot, spina bifida, hare-lip, cleft palate, hydrocephalus, etc. This, he added, cannot yet be dogmatically set down as demonstrated, although he believed it was on its way to be.

5. *Morbid Predispositions.*—It cannot be doubted, Professor Fournier continued, that hereditary syphilis, by reason, without doubt, of the state of relative impoverishment in which it places the organism, constitutes a decided predisposition to various maladies. It is incontestable, for example, that these infants are especially subject to affections of the nervous system. A great number die of convulsions and meningitis. Even if syphilis be not a direct cause of rickets, it is certain that it predisposes to it in a powerful manner, and that it represents one of its factors. Furthermore, the frequency of scrofulo-tuberculous affections in infants the offspring of syphilitic parentage has long been noted, and the possible transformation of syphilis into scrofula has even been discussed. This theory, however, after the discovery of the bacillus of Koch, cannot be longer sustained; but it is not less certain, for all that, that the syphilitic soil is eminently fitted and lends itself willingly to the culture of the bacillus. It is, in short, undeniable that hereditary syphilis pays a large tribute to the diverse manifestations of scrofulo-tuberculosis, and notably to affections of bones,—such, for example, as Pott's disease and hip-joint disease.

PHENACETIN IN WHOOPING-COUGH.

Dr. R. Heinmann reports in the *Journal de Médecine de Paris*, July 7, 1889, that he has obtained excellent results in whooping cough from the employment of phenacetin. In cases in which before the treatment the paroxysms of coughing occurred ten to fifteen times daily, they have, under this treatment, been reduced to three, and in some cases have completely disappeared within a few days, only occurring occasionally at night, when the administration of the remedy was suspended.

The doses which he employed were as f

lows: 6 grains, given in four doses, to a child 3 years of age; 5 grains, in three doses, to a child 2 years of age; 3 grains, in four doses, of about ¾ of a grain to a nursing infant 7 months of age.

Dr. Heinmann writes that he never observed any unpleasant after-effects. It does not appear, however, that the remedy produces a cure, for it is stated that whenever the treatment is suspended the paroxysms of coughing return with their original intensity and frequency.

THE SYMPTOMS OF ACUTE AND CHRONIC ARSENICAL POISONING.

According to the Paris correspondent of the *Medical Press and Circular* (July 10, 1889), at the Académie de Médecine, M. BROUARDEL read a very interesting paper on the "Symptoms of Acute and Chronic Arsenical Poisoning." First stage: Gastric derangement, mucous fever, vomiting, colic, etc. In chronic poisoning the vomiting is not painful, but frequent,—seven or eight times a day. Constipation is more frequently met with than diarrhœa. Second stage: Eruptions and laryngo-bronchitic catarrh. The cough is spasmodic, and sibilant râles are heard in the bronchi. The eruptions consist of epidermic exfoliations, and erythema of the eyelids and scrotum. Third stage: Headache and numbness in the lower extremities, with painful cramps, and, in exaggerated cases, severe pains of a lancinating character are felt, especially in the ankles. Fourth stage: Paralysis of the lower extremities, which seems to commence at the common extensors of the toes; in any case the paralysis persists the longest in these muscles. Convalescence from this intoxication is frequent, but very slow, at least when paralysis is present. Death supervenes frequently by the heart.

Means for recognizing Arsenical Poisoning.—The urine should first of all be examined, for the poison can be recognized in that liquid not only in a few minutes after its ingestion, but also when the patient has ceased taking it for many days.

As to the repartition of arsenic in the human body, DRAGENDORFF emitted the hypothesis that arsenic was substituted for phosphorus in the bony tissue, and recent analysis proved that no matter in which way the drug was administered, it accumulated very ensibly in the spongy osseous tissue, and ıed itself there, so that its presence can be detected in the cranial bones, and notably in the vertebræ after all trace of it has disappeared from the viscera. In the Havre poisoning case (referred to in our Paris letter), the presence of arsenic in the bones of the skull, the vertebræ, the skin, hair, and nails of the persons who succumbed, was detected with comparative ease.

M. OLLIER said that M. Brouardel had forgotten one symptom, which was frequently observed in arsenical poisoning, and that was bloody vomiting. The latter replied that the fact was possible, but he did not remember noticing any in the recent cases.

THE INFLUENCE OF PERMANGANATE OF POTASSIUM ON MENSTRUATION.

In the *British Medical Journal* for July 20, 1889, DR. W. STEPHENSON writes that his first impressions from the use of permanganate of potassium in amenorrhœa were unfavorable. But his subsequent investigations have confirmed the conclusions of Drs. Ringer and Murrell. Dr. Stephenson said that his experience extended over a treatment of one hundred and five cases in which reliable results were obtained.

In the present series the permanganate of potassium alone has been used. It was prescribed in the form of pill, containing two grains of the salt, with sufficient kaolin ointment; one pill three times a day after meals; in a few cases twelve grains a day were taken. Many of the patients continued to take the pills regularly for two and three months. In only three cases did they complain of any pain after the medicine, and in these reducing the number of pills per day or the dose in each was sufficient. His experience, therefore, is different from that of Dr. Döering, of America, who found that "the administration of the drug in doses large enough to be effective is accompanied by severe pain, which frequently necessitates a discontinuance of the remedy, and hence impairs its value as an emmenagogue." This result is explained by the mode of administration. He recommends it to be given in "capsules, taken midway between meals, and followed by large draughts of some pure mineral water." The drug is thus thrown rapidly in solution on the stomach, whereas the pills undergo very slow disintegration.

Amenorrhœa is the test which has mainly been used for the action of the permanganate, and, therefore, naturally leads to a condition

which tends to right itself. Unfortunately, it is deceptive. The greater part of the evidence adduced is, nevertheless, composed of such cases. The authors of the paper first referred to state: "Our most striking results have been obtained in young women between the ages of 18 and 25, who, from some accidental or trivial cause, such as catching cold or getting wet, have missed once or twice after having been regular."

Evidence of this character must be accepted with caution; and did the belief in the action of the permanganate rest on such alone, it would require a very large number of successive cases (not cases taken here and there) to eliminate the uncertainty that is inseparable from the affection. Two of the author's cases were instructive in this respect, for they both menstruated before they had taken the pills.

Dr. Stephenson states that he does not believe in emmenagogue remedies, and that such is not the action of permanganate of potassium, for he maintains that he has found it as serviceable in restraining the menstrual flow when in excess, as in promoting its recurrence when suppressed.

As regards the effect of the drug in amenorrhœa his investigations cover the following points: First, where menstruation has not been suppressed, but the intervals between the periods have been irregular, does the permanganate promote regularity? Secondly, where the periods have been regular, but the quantity has been scanty, does the permanganate increase the amount of the discharge? And, thirdly, has the remedy any influence in modifying the amount of suffering experienced at the periods?

An analysis of the one hundred and five cases gives the following results on these points: Of amenorrhœa, where menstruation had previously been fully established, there are twenty-two cases. Of these, the flow was re-established in twelve cases, and no such effect in eight; in two the remedy acted well at first, but on a subsequent amenorrhœa it failed. Of primitive amenorrhœa, or where menstruation had been imperfectly established, there are ten cases; in six good results were obtained, and in four none. In seven cases the interval was too long, but otherwise menstruation was natural; in five of these there was marked improvement, in two the character remained the same. In twenty-one cases menstruation was scanty in amount, and too long between the periods; in eleven there were good results, in ten no improvement. In eighteen cases there was very marked improvement in the amount of pelvic pains, and frequently the patients stated that they felt much stronger during the periods, and were not "so pulled down."

In estimating the value of these general results it must be remembered that in the inquiry the permanganate of potassium was prescribed indiscriminately, with the view of testing its action; the failures are, therefore, more numerous than they otherwise would have been had cases deemed most suitable been selected. Thus, a number of them were cases of chlorosis, where iron should first have been employed or given in conjunction with the manganese.

Dr. Stephenson further claims that permanganate of potassium is extremely useful in checking leucorrhœa, and in twenty-nine cases which were subject to menstrual headaches in only four of these was no relief obtained. Further, it is claimed, the permanganate will relieve ovarian pain, and of twenty-two cases in which ovarian pain was a special symptom, the relief is stated to have occurred in all to a more or less degree.

What appears to be an entirely new point, and one from which, from our point of view, is almost inconceivable, is the author's claim that in twenty-seven cases in which menstruation was in excess, either in time or in quantity, in two cases only was there no improvement in this condition under the use of permanganate of potassium. In fact, the author claims that the beneficial effect in this respect is even more marked and reliable than in the opposite condition of suppressed or scanty menstruation. Dr. Stephenson believes that this contradictory action may be explained by attributing the action of the drug to correcting the *constitutional* states which give rise to menstrual derangements, rather than to any specific effect on the uterine structures. Perhaps, also, some of the relief to menstrual suffering afforded by the permanganate is due to the improvement in vascular action.

BALSAM OF PERU IN PHTHISIS.

According to the Vienna correspondent of the *Medical Press and Circular* (July 10, 1889), PROFESSOR SCHNITZLER has for some time past been using balsam of Peru in cases of pulmonary phthisis with laryngeal lesions. It may be remembered that Landerer drew attention to the efficacy of this drug some time ago, but little has been heard of it since.

It may also be remembered that the drug acts differently on tuberculosis when injected directly into the veins than when given by the mouth. Dr. Schnitzler makes a solution of olei amygdalarum, mucilago gummi arabici, and chlorate of sodium 1 to 400, and in this form injects about .5 to 1 gramme of the drug. He advises the precaution of breaking up the oil globules every time before use, so that their dimensions are less than the blood-corpuscles. The results he has obtained from this form of treatment in tuberculosis appear to be satisfactory.

PINEAPPLE-JUICE IN BRONCHIAL CATARRH.

Dr. Flaschar recommends pineapple-juice as one of the best remedies for dissolving tough mucus secretion when obstructing the air-passages (*Journal de Médecine de Paris*, July 7, 1889). He claims that he has had remarkable success with this remedy in cases of chronic bronchitis, with insufficient expectoration and marked dyspnœa, while no accident or unpleasant result has ever followed its administration.

He prescribes it in doses of 8 or 10 teaspoonfuls at first, while later the quantity may be somewhat diminished. The method which he employs of preparing the juice is as follows: The fruit is cut in slices, which, after being sprinkled with sugar, are pressed in a glass vessel, then tightly closed. The vessel is then immersed in cold water, which is gradually heated to boiling,—a procedure which we should think would be apt to result in the explosion of the jar. The juice is, however, subsequently cooled, and is used as required.

SUBOXYGENATED AIR IN THE TREATMENT OF PHTHISIS.

At the Congress for the Study of Tuberculosis, which recently terminated its sittings in Paris, Dr. Valenzuela, of Madrid, read a paper on the "Curative Effects in Phthisis of Suboxygenated Air." The author advances the theory that in high altitudes the rarefied condition of the atmosphere necessitates greater functional activity in the respiratory apparatus, especially that portion formed by the thoracic parietes. As a given volume of the atmospheric air in high altitudes contains a considerably less weight of oxygen than air at the sea-level, to inhale the normal amount of oxygen increased respiratory activity is necessary, and to this and not to the greater purity of the atmosphere, nor to its dryness, is the beneficial effects of mountain air due. He found (*L'Union Médicale*, No. 45) that in Spain the deaths varied in proportion to the elevation; thus, in districts with an elevation less than one hundred metres above sea-level the mortality equalled twenty per cent. of those suffering from phthisis; at an elevation varying from one hundred to five hundred metres the mortality was ten to twelve per cent. In localities of over twelve hundred metres above sea-level phthisis is unknown.

According to Mr. George Foy (*Medical Press and Circular*, July 10, 1889), at an elevation of two thousand metres, he found diphtheria, smallpox, typhus, whooping-cough, pneumonia, and dysentery, but never phthisis. Acting on his theory that suboxygenation was, by causing increased respiratory activity, the beneficial agent, Dr. Valenzuela constructed pneumatic chambers, in which, by the addition of carbonic acid gas, he could diminish the percentage of oxygen present, and so increase the respiratory effort above the normal; this condition he usually kept up for two hours at a time, and repeated the suboxygenated air treatment two or three times a day for some months, never less than two. He obtained the best results. Of five hundred cases in the early stage all recovered, and of one thousand cases taken at hazard, seven hundred and forty-eight resulted favorably; difficulty of breathing disappeared; the thoracic measurement increased; the weight of the patient was greater; and the urine had less uric acid and more urea.

Before introducing his method of treatment to the profession, the author tested it for eight years in his laboratory in Madrid, and for four years in his hospital.

Combining the vapor of iodine, iodoform, chlorine, sulphurous acid, eucalyptol, or any other medicated vapors, adds, in some cases, to the efficacy of the suboxygenated air. From Germany comes another remedy for phthisis. Drs. Miguel and Rueff, according to the *Pharmaceutische Post* for March, 1889, recommend the inhalation of the biniodide of mercury. They base their opinions on a long series of observations made at the bedside.

The result of this method of treatment, according to our contemporary, is a very satisfactory one; often after its first administration the cough is reduced, and the expectoration, even in individuals with large cavities, be-

comes reduced in quantity, and loses its offensive odor; night-sweats disappear, and the body gains in weight. Their method of employment is to dissolve 1 part each of biniodide of mercury and iodide of potassium in 1000 parts of distilled water. This solution is employed in the form of a spray at first only once daily, and later, when the patients have become accustomed to it, twice daily. If it is found that the spray irritates, the solution may be reduced one-half in strength without the result being affected, since it is claimed that this preparation of mercury will destroy bacteria in concentration of 1 to 40,000.

One of the chief conditions of success is to prolong the use of the treatment, which may be carried out for a year or more without evil effect to the patient.

On reading these accounts, the mind imperceptibly reverts to the recollection of the Pneumatic Institution, at Clifton, of Thomas Beddoes, of Shiffnal, who used "fictitious air" for the treatment of phthisis, and held that an excess of oxygen was the predisposing, if not the exciting, cause of the disease.

LAMINARIA IN STRICTURE OF THE ŒSOPHAGUS.

PROFESSOR SENATOR has recently stated that for about a year past he has used laminaria in stricture of the gullet with comparatively good results. A piece of laminaria is attached to the end of an ordinary œsophageal bougie, and for greater safety this is further connected with a string running through the whole length of the bougie. Different sizes are used according to circumstances. The instrument is passed into the stricture and left in position from half an hour to an hour, during which time the laminaria swells to a considerable extent. In one case it expanded from one to one and a half millimetre in the course of half an hour. The surface of the laminaria remains smooth, and does not injure the mucous membrane. In most of the cases in which Dr. Senator has tried this plan the stricture has been cancerous, and, as he says, although "by gradual and frequently repeated pressure a carcinoma may cicatrize and become atrophied, this very seldom happens." In a large proportion of his cases, however, the treatment produced very marked dilatation of the stricture, so that the patients after a certain time could swallow much better than before. In some instances there was no improvement, and Professor Senator confesses that at first his anxiety to dilate the stricture as quickly as possible made him apply the treatment without sufficient regard for the tolerance of the diseased parts. If due care is not exercised, the laminaria may swell so much as to cause great pain, and even difficulty in removal. The most favorable cases for the treatment are, of course, those of cicatricial stricture. Dr. Senator points out that laminaria may also be used with good effect in narrowing of other canals, and he relates one case of stricture of the rectum in which he tried it, but apparently with indifferent success.—*British Medical Journal*, June 22, 1889.

Reviews.

DIABETES, ITS CAUSE AND PERMANENT CURE; FROM THE STAND-POINT OF EXPERIENCE AND SCIENTIFIC INVESTIGATION. By Emil Schnée, M.D., Consulting Physician at Carlsbad, etc. Translated by R. L. Tafel, A.M., Ph.D. English edition, revised and enlarged by author.

Philadelphia: P. Blakiston, Son & Co., 1889.

To the author the subject of diabetes presents but little difficulty. His work is dedicated to a prince of Sachsen-Weimar-Eisenach, and he knows all about the formation of sugar in the economy, and what it does when formed. He alone can bring order and certainty out of conflicting theories, and ascertain just where in the economy lies the fault. In these matters he is guided by the labor and research of others, giving the credit to Ebstein first and most of all. But he himself is a discoverer. With a true discoverer's innate modesty, we find (p. 31), "Herein lies the great mystery, never before discovered by any one, of the cause of diabetes; and here, according to my conviction, hereditary lues on the part of one of the parents, grandparents, or great-grandparents of the patient, has to be taken into consideration." In other words, he claims that while glycosuria is a transient condition, into which, from its very formation, any constitution under certain circumstances may fall. Diabetes "is never caused in that way;" it is "based upon a wrong composition of the protoplasm." To make us quite sure that he is talking about the real article,—the original old diabetes,—the author tells us something about it. "It is not a symptom;" a characteristic "is its freedom from fever;" "it is not infectious or contagious;" and we are glad the author has emphasized

this point, for now the awful dread of catching it will subside. No longer will diabetics be liable to quarantine, and be shunned as plague-stricken by their fellow-men. The efforts of Cl. Bernard, of Pavy, Schiff, Pettenkofer, and others seem to the author to have failed in reaching any cause, for "the real cause . . . the hereditary transmission of lues they did not discover." From this discovery it follows that the primary thing to be attacked in battling with diabetes "is not the formation of sugar, but the faulty composition of the protoplasm, and its inability to produce carbonic acid." For this, the author has proved in his first chapter, alone has the power of inhibiting the otherwise immense production of sugar by the economy. "The postulate, therefore, is the renovation of the entire protoplasm of the body." "My entire secret consists in restoring the equilibrium,—the balance in the 'change of substance.'" Thus we see why the author is so urgent in disassociating glycosuria from diabetes. No matter how long glycosuria, according to his idea of it, may exist, no matter if it leads to consumption and to death, "nevertheless glycosuria is not on that account diabetes;" and again, "I am acquainted with only one kind of diabetes, and this I treat as a hereditary disease."

All the "cures" hitherto made, according to our author, have been "glycosuria," which Carlsbad water may relieve and even cure. He alone has cured "real diabetes," and by his method "they remained thoroughly healthy." Nor are the numbers of cured trivial, since he gives a list of fifty-three patients, with their ages and sex, treated at Carlsbad and Nice from 1881 to 1884, while from 1884 to 1887 one hundred and sixty-five were treated. The author fails entirely in his efforts *to prove* that diabetes is derived from ancestral syphilis, but the reader must go over the collected evidence for himself. In the chapter on diagnosis the author gives a minute description of the "diabetic tongue," which may prove valuable, though little reliance can be placed upon its supposed identity with syphilitic psoriasis linguæ; in fact, the author drags for symptoms of his favorite "lues" with a very fine net. "Beauty spots, warts, pigment spots, white spots on the finger-nails, gouty deposits in the joints of the fingers and toes," are all to him "luetic." And, to finally clear the deck for action, we have two chapters on "Illusory Cures of Diabetes," all previous cures being "illusory," and upon "Statistics and Post-mortem Examinations," before we come to "Treatment of Diabetes." In this chapter the author asks the same question that the reader will be sure to ask, "Can defective protoplasm be made normal again?" granting that the author has stated a truth in attributing the disease to the cause, and has not merely used pseudo-scientific language to cover ignorance. How this is to be done we are told in this chapter. Still, after reading it, we are not sure that we have been made wiser. Certain sentences are suspicious. "In every particular case you have to individualize," and "in medicine you must guard against working by rote." True statements enough, but also excuses for failing to give us a clear, distinct account of how to renovate protoplasm. We learn that the skin must be cared for, the muscles exercised, Turkish baths and massage used, long breaths drawn, and many other useful things done, but still the protoplasm may be unchanged. Feeding is the basis of renewal. Feeding has been ere this the foundation of diabetic treatment, and the author gives us the diet-tables of Rollo, Bouchardat, Dickinson, Pavy, Cantani, Seegen, Düring, Frerichs, Ebstein, and draws from them his own conclusions. They all agree on certain points, and these the author brings out into prominence, but his own method is, he tells us, a "nourishment cure," rather than an "abstinence cure." Wonderful to relate, however, the author's "nourishment" is remarkably like his opponent's "abstinence." He seems to dread acids, and advises the diabetic to eat food "free from any particular acid," for which purpose he "prescribes a claret which contains but little sugar; also he "permits easily digestible articles of animal and vegetable food, which are free from starch." Further on he advises "chrome bread," which he explains as his own invention. Something, perhaps, like the "chrome buns" of Philadelphia notoriety. The formula, however, he gives. Saccharine, in his table, takes the place of sugar, and he rashly vouches that it "does not exert any injurious effect on the organism." For dinner the unhappy diabetic in our author's care is allowed only the regular diabetic regimen,—no starchy vegetables; and one wonders how he can call his dietary nourishing as opposed to the abstinence of others, until "snails" caught our eye. Our author allows the wretched diabetic—how wretched we had not realized before—to fatten on snails; and, though prohibiting acids, he advises "lemon sauce and cucumbers without vinegar," though allowing the

most acid wines, and he specially urges sour milk; in short, the diet-table of our author contradicts his claims, and is itself contradictory. For medicine, "Not a single specific medicinal remedy against diabetes has been discovered." Pilocarpine the author takes under his wing. He has used it, and "as a palliative medicine it has exercised a remarkable effect;" but, finally, the author introduces his own "combination method" with "extraordinary effects of both chromate of potassium and mercury, and, indeed, internally, as well as externally, in the massage." Internally he uses the "corrosive sublimate albuminate" of Bamberger's formula, also the "chrome-water," as used by Günze, of Dresden, after the carbonic acid has escaped, in addition iron and quinine as tonics. Alkaline waters, Carlsbad, or sodium bicarbonate, these are merely adjuvants. Here we have the author's discovery. Those who are convinced by his book will probably try it, but we confess that it wants the ring of truth. Possibly the translator has made things worse than they were originally. E. W. W.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS. Published monthly, $10.00 a year; single copies, $1.00. Vol. I., Nos. 3, 4, 5, for March, April, and May, 1889. New York: William Wood & Co., 56 and 58 Lafayette Place, 1889.

These monographs deserve to grow steadily in the reader's estimation. The March number completes Vol. I., and contains monographs on "Neurasthenia, Antipyresis, and Antipyretic Methods of Treatment," "The Tongue as an Indication of Disease," "On the Treatment of Cystic Goitre," and "New Remedies from 1878 to 1888." The first and second articles are by Von Ziemssen. The monograph on "The Tongue" is by Dr. W. H. Dickinson, and is profusely illustrated with wood-cuts and colored plates. Its perusal will tend to restore interest in the organ whose importance as an indicator of disease has declined very much in the last thirty years. But it seems probable that with increased knowledge and more accurate observation it will again rise into prominence. Indeed, the time has already gone by when a diagnosis based too strongly on the appearance of this organ excited derision of a mild type from the more advanced practitioner. The monograph on "New Remedies" only errs in being too brief and in failing to include many remedies of popularity.

The April number contains two articles,—a short but excellent one on "Diabetes, and its Connection with Heart-Disease," by Jacques Mayer; and one on "Blennorrhœa of the Sexual Organs and its Complications," which is extensive, thorough, and very valuable. This is by Dr. Ernest Furger. This article contains all that is worth knowing, up to date, and discusses the whole matter of male and female infection, diseases of the tubes, views of Noegerrath, method of using the endoscope, gives us a very careful analysis of the various methods of urethral medication, and, in short, is a good modern textbook to have.

The May number, Vol. II., No. 3, contains two monographs,—one on the "Preventive Treatment of Calculous Disease and the Use of Solvent Remedies," by Sir Henry Thompson, F.R.C.S., and M.B., Lon.; and one on "Sprains, their Consequences and Treatment," by C. W. Mansell Monlin, M.A., M.D., Oxon. The latter article will prove of more general interest and use than the former, which appeals to the surgeon specially, while a more perfect knowledge of the method of causation, history, and management of sprains will prove of incalculable value to the practitioner at large and his patients. Especially interesting is the chapter devoted to sprains of the ankle-joint and injuries destructive to the integrity of the tarsal arch, neuralgic joints as after-effects of sprain, chronic synovitis and its treatment, and all the fashionable injuries, the "tennis elbow and the cycle leg" are discussed; in fact, one can hardly imagine a more instructive course of post-graduate reading than this series of monographs affords, so far as yet published.

E. W. W.

THE DIAGNOSIS AND TREATMENT OF EXTRA-UTERINE PREGNANCY. By John Strahan, M.D., M.Ch., M.A.O., Royal University of Ireland, etc. Jenks prize essay of the College of Physicians of Philadelphia. Philadelphia: P. Blakiston, Son & Co., 1889.

Any better proof of the wisdom of prizes for the stimulation of writing could scarcely be afforded than is offered by this volume. The trustees of the fund may be congratulated on eliciting at the first effort such a great contribution to the literature of extra-uterine pregnancy. Since the volume of Parry nothing so original and thorough has appeared, and since the day of Parry how badly the whole point of view has changed. How valuable Parry's work was Dr. Strahan, however, illustrates on nearly every page, and to those who remember him and his short but bright career, his quoted words but serve to show

how great would in all probability have been his subsequent career had he been spared to enter upon what may be termed the "epoch of gynæcology."

Dr. Strahan is no mere statistician, but an argumentative writer of great force and of a very attractive style; and, in fact, it is his exceedingly enticing style that gives the peculiar charm to his work. And if any subject admits of argument, of logic based on the premises of common sense and sound statistics, such a subject is extra-uterine pregnancy.

Concerning the extreme difficulty of diagnosis, the author takes the ground of Mr. Tartt. All diagnostic means fail, and in the vast majority of cases the surgeon can only hope to operate on the occurrence of tubal rupture.

Having, however, diagnosticated the case before rupture, what is the best course? Is it puncture of the cyst through the vagina? is it intra-cystic injections of toxic agents, or electricity with or without puncture? or, finally, laparotomy? These questions the author discusses at great length and with such great clearness that the reader is fairly carried away, and yields ascent, willing or unwilling, to his views.

Probably the most valuable portions of the book are those which treat of diagnoses and of the methods of terminating pregnancy, with the operations at the various stages of the fœtal growth. The author throughout the book seems conversant with all the scattered literature of the subject, and his pages are filled with references and apt quotations. Certainly the book seems destined, for some time, at least, to be a standard work on the subject, and is of especial value from his exceedingly clear descriptions of the operative proceedings necessary in these cases. It is a book for every practitioner, since it deals with a condition likely to be met with anywhere, in the sparsely-settled country as readily as in the city, and which demands often instant interference, a condition where there is no time for consultations, no time to transport the patient to more scientific medical centres, but where the life of the mother always, and towards the end of pregnancy the life of the child also, may be saved by promptness from otherwise inevitable death. Hence the author appeals frequently to the simplicity and comparative ease of the operation demanded, and has spent much space in describing each step with great clearness; and, taking into consideration the fact that in all probability multitudes of women die of totally unsuspected tubal rupture, unsuspected both before and after the fatal event, we can hardly imagine a more useful work to be placed in the hands of the medical world. E. W. W.

PRACTICAL LESSONS IN NURSING: DISEASES AND INJURIES OF THE EAR, THEIR PREVENTION AND CURE. By Chas. Henry Burnett, A.M., M.D., etc. Philadelphia: J. B. Lippincott Company, 1889.

This is not intended as a deeply scientific work. Its place in the series of "Practical Lessons in Nursing" shows as much; but it is far over the heads of even well-trained nurses, and is an exceedingly useful, common-sense treatise on the ear and its diseases, carrying the practitioner as far in the matter as any but the professed specialist would care to go. If we might say so, it is aimed as much at saving the ear from wrong treatment as suggesting more proper methods, and in this field the author gives some excellent advice, and holds up to opprobrium the too ready methods of the "old family nurse" and the early traditions of our race on the subject. Evidently the care of the ear is better because more successful than its cure. We are glad to find Dr. Burnett coming out plainly on the subject of sea-bathing,—a subject on which many are absolute fanatics, who have elevated sea- and surf-bathing into a cult. How many lives it has shortened who took the reaction of insulted nature for the glow of health, but forgot the depression of the following hours, from which another plunge again revived them! The author gives some excellent advice on this subject, though, with a view to the preservation of his favorite organ, he doubts evidently whether we should ever bathe in cold water at all.

Another topic he touches on deserves remembering,—viz., cutting the hair short in winter, and the equally dangerous practice of guarding against subsequent cold by applications of bay rum, etc. In fact, as we read the author's words, we see how wrongly we all are doing in regard to our ears. It seems almost as though we were born with fundamental instincts driving us on to destroy our hearing whether we would or no, as if civilization were a failure indeed, for pocket-handkerchiefs incite us to blow our noses, which is dangerous, and decency to cut our hair, which is as hazardous, and a desire for cleanliness to bathe in cold water, which is suicidal; and, in short, life is one long struggle with vicious tendencies, which, while they, if indulged, make us cleaner, brighter, healthier, and happier, unfortunately threaten our hear-

ing. Still, if a little learning makes us thus unhappy, perhaps a little more will prove antidotal, and when we find the oculist urging us not to read for fear of blindness, and the dentist not to chew for fear of injurying the dental membrane, and the rectal specialist throwing out hints about the dangers of eating and so overworking his favorite organ, why, we get desperate, and we read by Philadelphia gas, which is the worst of gas, and chew gum and tobacco, and eat dinners, and plunge recklessly at the surf, and, after all, get along pretty well, unless we have been too careful, and put cotton in our ears, in which case we consult the aurist after some months of deafness, and he extracts it. Then in our burst of gratitude we thank heaven that there are aurists, and go out and do just as they advise us not to.

E. W. W.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, YEAR 1889.
Published by the Society, 1889.

There are many papers of great interest in these "Transactions." An enumeration of them would occupy too much space. There is the paper of Dr. J. Leonard Corning on "The Limitations of the Influence of the Mind upon the Body," which is both excellent and timely, though no one in his senses will expect to hear any answer to Dr. Corning's appeal to legislative action to put a stop to the travesty on medicine called the "mind-cure," or the parody on science and religion called Christian science. Perhaps there are, as the writer suggests, some well-meaning and partially sensible people involved. Certainly there are occasionally some "good people" in the correct sense of the term; but the best way to deal with the matter will be to let it live its weedy life, and die when at last its votaries tire of it and turn to some new and more alluring "ism."

Of an allied character, but more complete in its argument and definite in its thinking, is Dr. T. D. Crother's paper on "Inebriety from a Medical Point of View." No one can controvert Dr. Crother's argument, or deny the validity of his statistics and inferences, but it is always well to bear in mind that all drunkenness is not "inebriety," as he uses the word. For inebriety is a disease, the outcome of a diseased inheritance; and the amiable and cheerful consumptive, whose Christian resignation is an edification to all believers, may be suffering no more and no less truly from inherited disease than her drunken brother, whose orgies serve to "point a moral" as effectually as her virtues "to adorn a tale."

"On Chronic Headaches," by Chas. L. Dana, M.D., appeals at once to those who suffer in that way. Dr. Dana bases his remarks on an analysis of two hundred cases of "functional non-migrainous headaches." He divides head pain into three groups,—headache, neuralgia, and migraine,—and gives his idea of the cause of each. This study of a very obscure subject deserves careful consideration, and the paper is much more practical than the standard treatises on the subject, where the reader is involved in a maze very soon, and acquires a headache in the effort to understand it. A writer of a short article, if he is a clear writer, is forced to be brief, and his argument makes a distinct impression on the mind. Among other therapeutic suggestions, the author gives chloride of ammonium in large doses—3ss to 3i—in the headache of neurasthenia. In his experience antipyrin has been more successful in men than in women. Menthol, gr. v, in hot water, is a favorite remedy, or menthol with antifebrin. In young children the author advises syrup ferri iodid. in small doses. The reviewer feels like adding that in obscure headaches of the neurasthenic type very small doses of phosphorus have in his hands proved exceedingly useful.

Dr. L. Emmett Holt writes a paper on "The Prevention of Summer Diarrhœa among Infants viewed in the Light of the Lesions," and bases it upon some observations made in two autopsies on young children who died of acute pneumonia and from a fall respectively, and gave no signs of bowel-disease during life. Of the frequency of follicular ulceration in children suffering from summer diarrhœa, the author gives some astonishing proofs, and from this draws the general conclusions of his paper. There are many other articles of interest in these "Transactions," which the reader must discover for himself. We are sure he will be well repaid for the effort. E. W. W.

ELECTRICITY IN THE DISEASES OF WOMEN, WITH SPECIAL REFERENCE TO THE APPLICATION OF STRONG CURRENTS. By G. Belton Massey, M.D., etc.
Philadelphia and London: F. A. Davis, 1889.

The author believes that his is the first attempt at a complete treatise on the electrical treatment of women's diseases. The claims of Apostoli, Englemann, and Laphthorn

Smith have been submitted to a thorough examination at his hands, since "scientific investigation takes nothing from hearsay evidence." The book contains a full description of the electrical apparatus necessary for the work, details experiments illustrating the physical qualities of galvanic currents, describes the intrauterine application of electricity, electro-puncture, the faradic current in gynæcology, the Franklinic current, non-caustic applications, general precautions in use of electricity in nervous women, the electrical treatment of fibroids of the uterus, hemorrhage, chronic disease of the endometrium, subinvolutions, displacements, and extrauterine pregnancy, besides many more allied topics. So that one sees at a glance the wide field covered by the author; but the book must be read by an electrical expert to realize the thoroughness and value of Dr. Massey's work. E. W. W.

American Health Resorts, with Notes upon their Climate. By Bushrod W. James, A.M., M.D., etc. Intended for invalids and those who desire to preserve good health in a suitable climate.
Philadelphia and London: F. A. Davis, 1889.

This is an ambitious compendium of what the author knows and what he has discovered that others know on the subject. It gives us a very large map of the United States, and a great deal of information about climate, rainfall, prevailing winds, hotels, etc., and may prove useful to the traveller in the absence of a good guide-book. Its size and shape totally prevent its being used as a reference-book while on a journey, though it might be carried in a trunk, and studied while temporarily resting in a hotel.

The author also appends a translation of a portion of Dr. Woeikof's "Die Klimate der Erde," relating to North and South America and the Atlantic Ocean. E. W. W.

The Physicians' Leisure Library. The Treatment of the Morphine Disease. By Dr. Albrecht Erlenmeyer. Translated from the German by E. P. Hurd, M.D.
Detroit, Mich.: Geo. S. Davis, 1889.

This is a portion of one chapter only of "the great work of Dr. Albrecht Erlenmeyer" on the subject, but the translator has exercised good judgment in giving the public the portion that he has, for there is widely prevalent a very false idea of the best method of breaking the morphine habit and effecting a cure. The author makes it very clear that neither the gradual process of "tapering off," nor the sudden absolute stoppage of the drug, is the best; but he himself endorses what he has named the "rapid" method,—*i.e.*, not an absolute withdrawal *in toto*, but a withdrawal in a few days, accompanied by the most absolute watchfulness. To effect successful cures the patient should be admitted to an especially organized sanitarium. A mad-house, on the one hand, a general hospital, on the other, are not fit places, nor can the cure be conducted to a successful issue in a private house. The author is evidently practically acquainted with his subject, and therefore his book will furnish an excellent guide in dealing with these very troublesome and unsatisfactory cases. E. W. W.

Exploration of the Chest in Health and Disease. By Stephen Smith Burt, M.D., Professor of Clinical Medicine and Physical Diagnosis in New York, Post-Graduate Medical School and Hospital, etc.
New York: D. Appleton & Co., 1889.

This is a convenient hand-book of physical diagnosis, brief and clear, with some very good original illustrations. The instruction given is sound and precise. The author, perhaps, might give the student too lax an idea of the importance of high temperatures, and lead to a disregard of thermometric warnings, but otherwise his book is to be commended in every way. E. W. W.

Quiz Compend, No. 11. A Compend of Pharmacy. By F. E. Stewart, M.D., Ph.G., Quiz-Master in Chemistry and Theoretical Pharmacy in the Philadelphia College of Pharmacy, etc. Based upon Professor Joseph P. Remington's "Text-Book of Pharmacy."
Philadelphia: P. Blakiston, Son & Co., 1886.

This book will no doubt prove exceedingly useful to aspirants for pharmaceutical honors and degrees. To the physician it will prove of slight interest, other than in recalling his own antegraduate efforts at mastering the subject, when, alas! he did not possess, perhaps, any such aid.

Electricity and the Methods of its Employment in removing Superfluous Hair and other Facial Blemishes. By Plym. S. Hays, A.M., M.D., etc.
Chicago: W. T. Keener, 96 Washington Street, 1889.

This is a very good guide for one desiring to enter upon the career of a "superfluous hair-remover." It is a jealous specialty, and demands all one's time, patience, and skill. It requires also good eyesight and a steady hand. Sixty hairs an hour is about the limit of speed. Some only get up to twenty, and find that hard pulling. As for returns, they come in slowly. It takes three weeks for the

hair that has successfully avoided or evaded epilation to make its appearance. But it appears in about from fifty down to twenty, or even ten, per cent.; in fact, this pursuit possesses a positive fascination almost equal to the chase, and seems adapted to those genial and gentle souls who shrink from the responsibilities of active practice. To such we recommend the book cordially.

E. W. W.

A LABORATORY MANUAL OF CHEMISTRY, MEDICAL, AND PHARMACEUTICAL. By Oscar Oldberg, Pharm.D., etc., and John D. Long, Sc.D., etc. With original illustrations.

Chicago: W. T. Keener, 96 Washington Street, 1887.

This is a very elaborate and thoroughly practical work, and differs from the average work on the subject in being intended for actual daily use. Its type is large and clear, and can be easily read while following its directions in the laboratory. To the practical pharmaceutical chemist we imagine this work, or one similar, is a necessity.

E. W. W.

Correspondence.

PARIS.

(From our Special Correspondent.)

Dr. Brown-Séquard's Reviving Injections — Chronic Arsenical Poisoning—Anise- and Fennel-Seed Oils not alike Therapeutically.

Dr. Brown-Séquard's strange experiments have been confirmed by Dr. G. Variot, whose testimony is all the more valuable that he frankly confessed he had but little faith in the method when he tried it in several cases which all previous treatment failed to benefit. And to make sure his patients were not influenced by suggestion, the medicine was before them simply designated as a strengthening liquor (*liqueur fortifiante*). Said Dr. Variot before the Paris Biological Society: "The liquid used in subcutaneous injections was prepared by bruising in 10 c.c. (2½ drachms) of distilled water a freshly-excised rabbit or guinea-pig's testicle, and after a few minutes' trituration, decanting the slightly bloody liquid from the solid particles. In each experiment 2 c.c. were injected under the skin, forty-eight hours elapsing between the injections. The first patient was a house-painter, aged 54, much emaciated by chronic lead-poisoning and general debility. On June 22—the man had been eight days in bed from much weakness—the first injection was given. For three or four hours some pain resulted, accompanied with a feeling of general uneasiness and stiffness of the limbs. But the same evening the patient felt unusually comfortable, remarking he was like a new man, livelier, stronger, and stimulated every way. The second injection, two days later, acted likewise, increasing the man's heartiness, sharpening his appetite, and causing erections long unknown. A third injection, on June 26, had substantially similar results. The second patient, aged 56, a man debilitated by long want and suffering, received successively three injections, the first and second with rabbit's and the third with guinea-pig's testicle macerations. The effects were, excepting the erections, much like those observed in the case preceding. The third was a man aged 68, just recovering from an attack of pulmonary congestion and bronchitis, and for years subject to bladder-troubles, due to enlargement of the prostate. The patient kept to his bed most of the time, felt very weak, and ate but little. On June 24, two injections of rabbit's maceration were administered. For several hours rather sharp pain and great uneasiness were experienced, but the next day the man said he began to feel the strengthening liquor, enjoyed a good walk, and thought himself strong enough to practise with the dumb-bells as when he was 20. On the 26th he woke up more hungry than he had been for years, and remarked he wanted to grow strong as soon as possible, so as to undergo the operation for his bladder affection. A second injection, on June 26, of guinea-pig's maceration, caused a continuation of the same effects, and during the night of the 27th an intense erection. He expressed himself highly satisfied with the treatment. From the foregoing experiments I think the following conclusions may fairly be drawn: 1. The injections are, perhaps, painful, but in no way dangerous. 2. The febrile excitation, suggested by Dr. Féré, will not suffice to explain the phenomena observed. 3. After the first injection, the subsequent ones, although still painful, no longer cause general uneasiness. 4. The positive effects are a general stimulation of the nervous system, increase of muscular strength, regulation of the visceral and digestive functions, and some cerebral excitement. Genesic stimulation is not a constant result. My experiments so far consider too few to enable me to absolutel

adopt Dr. Brown-Séquard's theories, neither do I feel disposed to contradict them. But I do believe the investigations deserve to be pursued on further, with strict scientific precautions." To which Dr. Brown-Séquard at the same meeting replied that Dr. Variot's observations fully confirmed his own, and the more so that the experiments were made with patients unaware of the nature of the medication. Unlike himself, who knew what he was using on his own person, the men only thought some strengthening preparation was administered, and consequently could not have been influenced by any sort of suggestion, always to be feared when dealing with nervous phenomena. He would, however, take some exceptions as to the *modus operandi*. "In the first place, the maceration liquor should be filtered, not merely through paper, but through a Pasteur's porcelain filter. Although no harm resulted in the instances related, to neglect this precaution is to run the danger of septicæmia. Next the choice of the animal is of some importance, the guinea-pig being preferable to both the rabbit and the dog, as with the first there is a risk of inoculating worm eggs and with the second hydrophobia, unless the animal has been observed a good while, in which case it may present some advantages. And, lastly, as regards the cases wherein the injections are likely to be beneficial, they are indicated not only in senile debility, but also when weakness originates from seminal losses, testicular troubles, or venereal excesses, especially during old age." Thus ended a discussion which here greatly interests the medical profession. As to the general public, always ready for a joke, they characterize the situation by the common saying, "Le docteur nous pose un lapin," which corresponds to the New York slang, "He is giving us a kid," with the advantage of mentioning the rabbit.

There is probably but little new to be said nowadays about acute arsenical poisoning. With the chronic intoxication, however, much still remains to be learned. Within less than a year two conspicuous instances of the more insidious form of poisoning have occurred here, and attracted considerable attention. In the first, which happened at Hyères, near Toulon, arsenious acid somehow found its way into the wine supplied by a large vintner, the Comte de Villeneuve, to a whole region, and caused many deaths and numberless accidents. It never was ascertained how or by whom the poison was introduced into the beverage, but the count, as the proprietor, was held responsible, and for the technical offence of "homicide through imprudence," sentenced to a fine and damages. The other case occurred in a pharmacy at Havre, where, in the space of eighteen months, three persons, including the pharmacist, M. Decamp, and his wife, died of arsenical poisoning, and every one employed on the premises, or only taking a meal there, became dangerously ill. The head clerk, Pastré-Beaussier, was accused and put on trial, because he alone all the while kept in robust health, and the accidents ceased when he left. But as nothing more could be proved against him, he was acquitted by the jury, and the tragedy remains as mysterious as ever. Drs. Brouardel and Gabriel Pouchat, who as experts were connected with the judicial investigations of both affairs, have this month read before the Academy of Medicine a most instructive communication respecting chronic arsenical poisoning. Basing their remarks on the few data already known, but chiefly on their own observations, they have established the following symptomatology in regular order: 1. Digestive troubles, which are usually the first to appear. These sometimes consist in simple uneasiness and dyspepsia, but often present the symptoms of a mucous or even typhoid fever, as occurred in some of the Havre and Hyères cases. Contrary to what occurs with acute poisoning, the vomitings are painless. 2. Eruptions and laryngo-bronchial catarrh. At Hyères, such was the frequency of catarrh that the physicians attributed it to an epidemic of spasmodic influenza. The same was observed in one patient at Havre, and in both places intense coryza, cutaneous eruptions, and squamous exfoliations were noticed. In two instances nails fell off. 3. Nervous troubles. Intense cephalalgia is common, and so is loss of sensibility, accompanied with either numbness or itching. For instance, a child would say he felt butterflies creeping up his back, and a drug clerk take off his shoes behind the counter, and strike the soles of his feet with a spatula to get the blood to circulate. 4. Paralysis. This last stage, which is sometimes absent, was more especially studied by Dr. Marie, formerly the head of Dr. Charcot's clinic, and it was owing to his special training that the experts were enabled to decide on an arsenical poisoning before autopsy had settled the point. The symptoms are characteristic, and were described with minute accuracy. Unfortunately, the

passage is too lengthy to be given in full, and would be almost useless if abbreviated. To conclude the medical side of the question, the termination should be considered. A cure often ensues when the symptoms have not reached the last stages, but it is very slow when paralysis has become established. A whole year may then be necessary. Death mostly results from heart-troubles. In the case of pharmacist Decamp, his physicians had diagnosticated infectious endocarditis. His servant, Maurice, in the full paralytic period, had left the fatal house six weeks when she suddenly died in the hospital. Yet none of the victims proved to have any valvular lesion of the heart. Death may also be the consequence of renal or muscular alterations, and take place even after all poison has been eliminated. The chemical aspect of the question is no less important and instructive. In cases of suspected chronic poisoning, Drs. Brouardel and Pouchat strongly advise to examine the urine, as the analysis can be performed without awakening any suspicion, and the arsenic can be detected long after the poison has been administered. So slow is the elimination that in one instance arsenic was found in the urine of a patient who had been treated with Fowler's solution, forty days after the medicine had been stopped on account of dangerous symptoms. Another method, also practicable during the patient's life, is to analyze the hair. Under some pretext it can be cut off without exciting any remark, and in case of chronic poisoning, arsenic will easily be detected. One milligramme was found in one hundred grammes of Mme. Decamp's hair, and one or two in her husband's hair and beard, weighing forty grammes. As regards post-mortem examination, after acute poisoning, arsenic, as is well known, will be mostly found in the viscera, but in chronic intoxication the poison is to be looked for elsewhere. It will be found accumulated in the spongy tissue of the bones, especially the cranium and vertebræ, the scapulæ, etc. The hair, nails, and skin will also retain it, and likewise store it for a considerable period after the last dose has been administered. Such are the important conclusions arrived at after a varied and extensive experience with those now celebrated cases, and corroborating experiments made on animals.

That similarity of chemical composition will not always entail identity of therapeutic properties has long been known. Another interesting instance of the fact is the difference between fennel-seed and anise-seed oil, which has just been pointed out by Drs. Cadéac and Albin Meunier, of the Lyons Medical Society. Chemically, the two oils are isomeric, and formed of a hydrocarbon isomeric with turpentine, and an oxygenated oil oxidizable into aldehyde and anisic acid. Their flavor is so nearly alike that both are used indifferently for flavoring cordials and absinthe, as well as in carminative mixtures. Yet their therapeutic properties are not at all the same. Drs. Cadéac and Meunier have, on experimenting, found the following differences. Externally, oil of fennel is less irritating than anise. When applied pure, oil of anise will cause on human skin a severe papular eruption, lasting fifteen or twenty days, while the effect of fennel oil will under the same conditions be evanescent and scarcely appreciable. In therapeutic as in poisonous doses, both oils present two distinct periods, —one of excitation, the other of depression. In medicinal doses, the first period with oil of fennel is rapidly developed, well marked, and lasts about an hour; with oil of anise, on the contrary, the excitation is slight, uncertain, and barely lasting more than a few minutes. Both in large doses bring on epileptiform convulsions, but fennel alone causes a curious premonitory symptom, consisting in the powerful tendency of the subject to walk backward. Such a phenomenon is never observed with oil of anise, and larger repeated doses are necessary to obtain the epileptiform effects, which never fail to appear with fennel. Everything being considered, anise should be classed with the soporifics and fennel with the excitants. Again, as a carminative, fennel is more powerful; it will cause sudden and violent intestinal contractions and abundant defecation, while anise is milder and operates painlessly. Both increase the appetite and promote digestion, and both augment the bilious secretion without affecting the kidneys; but fennel powerfully contracts the stomach, and is liable to give cramps. In lethal quantities fennel kills by stopping the heart, and anise by stopping the respiration. Their poisonous doses are also different. With oil of fennel, 12 grammes (3 drachms) sufficed to kill a four kilogramme dog in four and a half hours; with oil of anise, 8 grammes (7 drachms) were necessary to kill a six and a half kilogramme dog in twenty hours. And, finally, fennel-seed oil is a more efficient antiseptic, as was proved by experiments with various microbian liquids.

PARIS, July 19, 1889.

THE LATE JAMES E. MORGAN, M.D., OF WASHINGTON CITY.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I ask brief space for an expression of sincere regard,—an humble but honest tribute to the memory of Dr. James Ethelbert Morgan, Emeritus Professor of Materia Medica in the Medical Department of the University of Georgetown, District of Columbia, who died June 2, 1889.

In the antebellum days Dr. Morgan was my preceptor, physician, and friend. Four years of such relations with such a man could but impress any one; the after-time could alone demonstrate to me the inestimable value of his teachings, the priceless beneficence of his example. As memories of all this—his timely words so fitly spoken, his almost stealthy but many and telling acts of kindness—come trooping to me at thought of his lamented death, I tide insensibly into seeming eulogy while aiming to speak the simplest truths of this grand man. Clear-headed and great-hearted, earnest and honest, courtly and brave; as a physician, thoughtful and wise; as a man, just, generous, and true, he was in all else superior to most men. In these, his distinguishing traits, he was the peer of any. In the name of it all came his abundant success as physician and teacher. As a logical sequence, there followed the love and respect of all who were so fortunate as to really know him. Upon a field and at a time when brainy men, no less than now, were the rule at the national capital, he went promptly to the front, and by sheer force of God-given fitness, solid acquirements, and the invincible magnetism of a true nobility, won, held, and now transmits a name of which those who bear it may well be proud.

As the generations come and go, it now and then falls out, through a generous mood of nature or the hidden purpose of an all-wise Being, that, even in an era of overproduction in all that is bright and good, some one figure outranks and compels admiration where 'twere seemingly invidious to discriminate. So it was of Dr. Morgan, at the time of which I write, among those for whom I speak,—his students and early friends of the class of 1860–61 at the University of Georgetown, District of Columbia. Many there were of his compeers, bright in genius and generous of soul: there was but one Morgan, in our eyes the shining exemplar of every manly impulse, and comparable only to himself. In the truest and best sense he was the student's, the young man's, friend. As such I valued and honored him, beg thus to speak of him, not in mere eulogy, but in earnest terms, befitting his merits.

Truly the world is brighter and better for the lives of such men,—lives which not only illumine the coming track, but in their reflex throw a mellow tint over the dark and rugged pathway of personal experience, bringing into relief here and there living oases in an otherwise dreary waste.

Very respectfully,

A. G. BROWNING, M.D.

MAYSVILLE, KY., June 30, 1889.

TREATMENT OF YELLOW FEVER.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Will you please publish in your next issue the following extract from a letter just received from Dr. Sollace Mitchell, of Jacksonville, Fla., relating to my paper on the treatment of yellow fever, published in the May number of the GAZETTE:

"In speaking of the cases on bichloride *without* the soda (page 302, bottom of second column), you quote me as having 'twenty-five recoveries from black vomit,' whereas it should be FIVE. I do not know how I could have made the mistake in writing out the report for you."

By making this correction you will oblige.

Yours truly,

GEO. M. STERNBERG.

HAVANA, July 13, 1889.

Notes and Queries.

SULPHONAL AS AN HYPNOTIC IN INSANITY.

In an article on sulphonal as an hypnotic in insanity, DR. SAMUEL GARNIER, in the *Annales Medico-Psychologiques* for January and March, 1889, reports at length upon its action in seventeen cases, and concludes that—

1. Sulphonal is an hypnotic of most remarkable intrinsic value in cases of insanity. In nearly every case of insomnia sleep was produced by doses varying from 2 to 5 grammes.

2. It proved efficacious in cases in which paraldehyde, urethan, chloral, and hypnone had invariably failed to act.

3. The advantages of sulphonal in the in-

somnia of the insane are: the nature and amount of sleep procured by the doses mentioned; the facility in administering the drug by reason of its freedom from taste and odor, and also the fact that it has no appreciable effect upon the respiration, circulation, or digestion.

4. It should be stated in regard to its action upon digestion that as in 5.5 per cent. of the cases it excited vomiting, and in 17.7 per cent. slight diarrhœa, its use is contraindicated when these phenomena appear.

5. The use of sulphonal is sometimes attended with vertigo and difficulty in keeping the equilibrium, the patient appearing in this respect as if intoxicated. It may possibly be contraindicated in the congestive forms of insanity.

6. The fact that it had a diuretic effect in 17.7 per cent. of the cases should be borne in mind when administering it.

7. Its calmative action by day is wanting even after a large dose, and if produced it is usually only a somnolence induced the day following the administration of the drug, a condition it is well to avoid by reducing the dose.

8. After divided doses, in the single instance in which it was so administered, no sedative effect resulted by day and scarcely any at night.

9. About one-half of the cases to which sulphonal was administered only on alternate days were comparatively restful during the intervening nights.

10. In sane subjects, sulphonal appears unquestionably to provoke and prolong sleep, as well as to render it more profound. The phenomena attending its use are few and of little consequence. It is indicated in all cases of nervous insomnia.—*Boston Medical and Surgical Journal*, April 18, 1889.

POISONING BY ROBURITE.

Dr. Ross reports several cases of poisoning by roburite,—a new explosive agent used for blasting in coal-mines, and the chief constituent of which is di-nitro-benzol. The following is a brief account of the most typical of the half-dozen cases recorded in the paper before us. The patient was aged 42; he had been a miner for many years; had always enjoyed excellent health, and had always been a temperate man. Five months previously he had commenced using roburite, and soon noticed smarting of his eyes and face. This was followed by headaches, and, in about two months, he began to complain of numbness in his finger-tips and toes, shortness of breath and palpitation; more recently he had suffered from shooting pains in his legs, his grasp had become feeble, and his legs felt heavy and weak. He had lost flesh, become drowsy and apathetic, and his urine was sometimes very high-colored. He was a well-built man, face extremely pale, lips of a bright-blue tint. His fingers and toes felt numb, but there was no affection of cutaneous sensibility. The intrinsic muscles of his hands were somewhat wasted, and his grasp was not what it should have been. The patient had lost all spring and elasticity in walking, but his feet did not drop. The patient complained of twitchings of the legs, especially when he was in bed; the knee-jerks were absent; the plantar reflex was normal, the cremasteric absent, and the patient stated that he had lost all sexual desire. The special senses were unaffected. His field of vision was not contracted, and his color perception was normal. The urine was high-colored, containing a deposit of pink urates, and a trace of bile; his conjunctivæ were slightly jaundiced. His blood was examined with the spectroscope, and it was found that the two bands to the violet side of the D line were not reduced to one on the addition of ammonium sulphide as quickly as in the blood of a healthy man. He rapidly improved when he desisted from his occupation. Dr. Ross points out that the nervous phenomena—the muscular weakness, loss of knee-jerks, etc.—must be referred to peripheral neuritis.—*London Medical Recorder*, May 20, 1889.

PERMANGANATE OF POTASSIUM PILLS.

Two correspondents have recently called the attention of the *Pharmaceutical Journal and Transactions* to the value of lanolin as an excipient in making pills of potassium permanganate. Ernest W. Gough says, in this respect: "As far as appearance goes the pills turned out all that could be desired. I kept a dozen to see if any change took place, and as far as I can see, none has occurred. The pills were varnished with sandarac and alcohol varnish (Martindale). I have not seen any note about lanolin being used before for this purpose.

"Perhaps some of your readers will be ab

to say whether any decomposition is likely to occur if kept any length of time. The total weight of the mass was twenty-nine grains, the formula used being—

"Potassium permanganate, gr. xxiv;
Kaolin, gr. ii;
Lanolin, q.s.

"The pills, I may say, are comparatively hard, and retain their shape perfectly."

J. H. MILLER hit upon the same combination, and wrote a communication to the same journal, from which we extract as follows:

"As the pills I have massed with lanolin have only been made a comparatively short time, it remains to be seen whether the new method is equal to kaolin and soft paraffin in preventing decomposition, but they are still, as you will see, in very good condition. As an excipient, it is simplicity itself, and exceedingly easy to work, ordinary anhydrous lanolin, in the proportion of 1 to 10 of permanganate, turning out a beautiful, perfect pill, only half the size of those made by the old method, and without any trouble."—*National Druggist*, July 1, 1889.

DANGEROUS CHLOROFORM.

Some chloroform obtained from a highly respectable German firm having aroused the suspicions of operators by the frequency with which patients anæsthetized with it presented grave symptoms, PROFESSOR MENTHIN, of Warsaw, undertook to examine it, along with a number of chloroforms obtained from other firms. The results were that not a single sample entirely answered the tests of the Russian Pharmacopœia, which are somewhat stringent, though less so than those of the French Codex. Professor Menthin—whose article is published in the *Vrach*, giving details and names of the firms from which the different samples were obtained—found that all the specimens left a residue on evaporation, some of these residues being evidently of a very prejudicial character, causing headache and giddiness on prolonged smelling. One of them smelt at first like nitro-benzol with an admixture of tobacco, the odor changing in two days to one like benzoic acid. When heated, this residue gave off an odor resembling burnt india-rubber. One of these samples came from a British firm, and appears to have been by far the best of them all, thirty-nine cubic centimetres leaving only a residue weighing .0001 gramme, and having a transitory smell of malic ether; whereas forty-nine cubic centimetres of one of the German specimens left a residue weighing .0022 gramme, and of a peculiarly offensive character. Professor Menthin's investigations would seem to offer some explanation of the extreme care taken by some of our continental brethren in regard to the use of chloroform. If much of what is used is as impure as some of the specimens referred to, it is scarcely to be wondered at that the results are sometimes disastrous. The specimen which was the immediate cause of the investigation is stated to have produced in no less than half of the patients such dangerous symptoms that its administration had to be discontinued. To all appearance, however, it was perfectly good, having a specific gravity of 1.487, neutral reaction, containing no free chlorine, and not undergoing any change of color when mixed with hot sulphuric acid and left to stand for twenty-four hours. The sequel, of course, shows that these preliminary tests are very insufficient.—*Lancet*, July 6, 1889.

HYDROXYLAMIN.

Hydroxylamin is a substance which has recently been attracting a good deal of attention as a substitute for pyrogallic acid and chrysarobin in the treatment of diseases of the skin, being possessed of all the good qualities of the former substances without their inconvenience.

Hydroxylamin was discovered in 1865 by W. Lossen by reduction of nitric acid as a basis analogous to ammonia, its chemical composition being NH_2OH. It is known only in aqueous solution and in its salts. It may be considered as ammonia, in which one atom of hydrogen is replaced by hydroxyl.

$$N\left|\begin{matrix}H\\H\\H\end{matrix}\right\} \text{ ammonia } N\left|\begin{matrix}OH\\H\\H\end{matrix}\right\} \text{ hydroxylamin.}$$

The most important among the salts of hydroxylamin is hydrochloric hydroxylamin or hydroxylammonia chloride: NH_2OHHCl. It appears in well-developed, colorless, strongly hygroscopic crystals, easily soluble in water, glycerin, and alcohol.

Hydrochloric hydroxylamin, according to Lossen, is prepared by reducing nitric acthyl-ether with granulated tin. According to Maumene it is obtained by the action of hydrochloric acid and tin on a solution of nitrate of ammo-

nia. According to Ludwig and Hein, it may be obtained by a current of oxide of nitrogen passing through a mixture of hydrochloric acid and granulated tin. The solution obtained by either of these methods is decanted from the tin which has remained undissolved; it contains hydrochloric hydroxylamin, in conjunction with chloride of ammonia, chloride of tin, and chloruret of tin.

On account of its present low price, hydrochloric hydroxylamin has been recommended lately as a reductive in photography and analytical chemistry.

Hydrochloric hydroxylamin may, according to its preparation, contain free hydrochloric acid, iron,—from the tin,—chloride of ammonia, and chloride of barium.

In the *Pacific Record of Medicine and Surgery*, March 15, 1889, DR. P. J. EICHHOFF recommends its use in solution of 1 part of the hydrochlorate of hydroxylamin and 50 parts each of alcohol and glycerin, to be applied externally. With this solution the dermic parts under treatment may be brushed from three to five times daily, after washing them thoroughly with potash soap, this form being preferred by the author to an ointment from the fact of its passing more readily into the skin. The author states that he has treated in this way five cases of lupus vulgaris, five cases of herpes tonsurans, and one case of sycosis, the effect in lupus being especially encouraging.

NOTE ON THE DILUTION OF COW'S MILK IN INFANT FEEDING.

The following may be of interest as having a bearing on Dr. Rotch's article on this subject, published in the *Pharm. Journ.* for March 2, page 706. MR. GEO. SMITH, in September, 1886, had occasion to consider this question in his daughter's case, owing to the mother's deficiency in milk. The food used as a substitute on that occasion has proved so successful in more than one case that it merits recording (*Pharmaceutical Journal and Transactions*, July 6, 1889).

The formula is mainly based on a process devised by Professor Frankland in rearing one of his own children (*vide* "Experimental Researches," pp. 843, 844).

In his paper (published December, 1854) Professor Frankland gives the percentage amounts of the different constituents of human, ass's, and cow's milk, as follows:

	Woman.	Ass.	Cow.
Casein.....	2.7	1.7	4.2
Butter.....	3.5	1.3	3.8
Milk-sugar.....	5.9	4.5	3.8
Salts.....	.2	.5	.7

These figures for human and cow's milk differ in several respects from the averages deduced from a wider range of analyses which are quoted by Mr. Thos. Maden in a paper published in the *Pharm. Journ.* for March 23 (pp. 768, 769), the most notable differences being those of sugar and fat; but on referring to the minimum and maximum figures found by Professor Leeds, from analyses of eighty samples of human milk from different sources, it will be seen that those given by Professor Frankland provide him with a basis for a formula which produces a fair imitation of human milk from that of the cow.

In this formula Professor Frankland takes no account of the differences in coagulable and non-coagulable albuminoids existing in each of the respective milks. His process practically consists in the precipitation (by means of rennet) of one-third of the casein from fresh cow's milk, and the addition of one-third more milk-sugar, but Mr. Smith found this somewhat tedious, except to a specially trained person. The process of dilution with water was adopted because it was simpler and would enable the food to be prepared in a few minutes whenever it was required.

Taking Professor Frankland's figures for the average of fresh cow's milk, as quoted, it will be seen that when it is diluted with water in the proportion of 3 parts of the former to 2 parts of the latter, the average amount of constituents is modified as follows:

Fresh cow's milk 3 parts, water 2 parts.
Casein, 2.52 per cent.;
Fat, 2.28 per cent.;
Sugar, 2.28 per cent.;
Ash, .42 per cent.

From these figures the writer compiled the following formula.

The albuminoids, fat, and milk-sugar are by calculation made to approximate as nearly as possible to the average of these constituents in human milk.

Finely ground oatmeal ℥¼, gradually increasing to ℥ij
Fresh butter, ʒi;
Milk-sugar, ʒii;
Fresh cow's milk, f℥vi;
Pure water, f℥iv;
Salt, gr. v, or a sufficiency.

Mix gradually the water with the oatmeal, milk-s and salt, so that no lumps are formed in the mixtu

add the milk and butter, and heat to the boiling-point in a clean, enamelled saucepan. The product should be made up to the measure of half a pint, if necessary, and given lukewarm with a spoon when required.

The oatmeal was introduced as a useful attenuant, and it has been found to act as a laxative, and also as a direct fat and heat producer in the process of digestion. The process of feeding with a spoon is at first troublesome, but it is to be preferred to the use of a feeding-bottle, as, if care be taken to have all the vessels employed scrupulously clean, the infant will enjoy an immunity from thrush (*Oidium albicans*), diarrhœa, and other diseases that follow in their train.

A CASE OF POISONING BY THE OIL OF HEDEOMA (PENNYROYAL).

In the *Boston Medical Journal* for May 30, 1889, Dr. U. O. B. Wingate writes that on November 20, 1888, he was summoned to see a patient said to be in a fit, and found a woman, about 20 years of age, lying on a lounge and wholly unconscious; pulse small; respiration very quiet; extremities cold; pupils moderately dilated; no froth in the mouth; could not be aroused. A neighbor present stated that the patient had experienced some domestic trouble that morning, and on hearing a noise she came in and found the patient on the floor, where she had apparently fallen from a chair. No one was in the room at the time she fell.

This was all the history that could be obtained, with the exception that the patient was supposed to be about four months advanced in her first pregnancy. Suspecting hysterical causes, on account of domestic trouble, Dr. Wingate applied digital pressure over the supraorbital nerves. In about a minute convulsive movements of the face began, quickly followed by a general tremor over the entire body, resembling a severe chill; then the body gradually and methodically assumed the position of extreme opisthotonos, the patient resting entirely on the occiput and heels. The arms, hands, and fingers became strongly flexed, and the whole body was in a rigid tonic convulsion. In about a minute the muscles relaxed, the relaxation lasting about two minutes, when another convulsion of the same character came on. By this time Dr. Wingate had administered gr. $\frac{1}{4}$ morphine sulph. and gr. $\frac{1}{120}$ atropine sulph. subcutaneously. The patient had no more convulsions, but soon vomited, and began to answer questions. She then stated that at 10 A.M. that morning she had taken a teaspoonful of the oil of pennyroyal and a half-teaspoonful of the fluid ext. ergot at a single dose, with the object of procuring an abortion. She was put to bed, heaters applied, and given as much milk as she could be made to take. She talked incoherently for a few hours, complained of great lameness in the muscles of the neck and back, and also of the flexors of the arms. The next morning she was sitting up; had some pain in the back, but no uterine action was provoked.

The toxic symptoms did not appear until about one and one-half hours after the drug was taken. This slow action is also true of other oils, especially of the oil of tansy. Dr. Wingate adds that three months later he saw the patient, and she was then well advanced in her pregnancy.

MANDRAGORA ALKALOIDS.

Some of the uncertainty that has hitherto existed as to the active principles of mandragora root appears to have been cleared up by a recent investigation by Herr Ahrens, who reports that he has separated two basic substances that are probably isomers of hyoscyamine (*Annalen*, ccli., 312). The residue from the evaporation of an alcoholic extract of the roots was treated with acidulated water, the solution heated with potassium carbonate in excess and then shaken with ether and the ether evaporated, when a deliquescent alkaloidal substance was left, which when dried over sulphuric acid resembled a brittle resin. When neutralized with sulphuric acid it formed a sulphate crystallizing in white scales, a solution of which dropped into the eye dilated the pupil. Analysis of the gold salt gave results to the formula $C_{17}H_{23}NO_3HCL$ AuCL, or the same as that of hyoscyamine, atropine, and hyoscine. But although the gold salt had much of the external appearance of hyoscyamine gold salt, and a melting point only six or eight degrees lower, the properties of the other salts studied differed widely from the corresponding salts of hyoscyamine, and moreover the new substance was not converted into atropine by prolonged contact with alkaline liquor. Herr Ahrens is therefore convinced that the substance is a new isomer of the belladonna alkaloids and has named it "mandragorine." The press residue left after the extraction with alcohol was then treated with acidulated water and the aqueous solution supersaturated with potas-

sium carbonate was shaken with ether, which left on evaporation an oily base that did not crystallize over sulphuric acid. A solution of the sulphate of this substance, which could not be obtained crystalline, when applied to the eye also dilated the pupil. The mercuric chloride, platinochloride, and gold double salts were obtained crystalline; but the quantity available was too small to allow of the determination of its composition, although Herr Ahrens thinks it is probably another isomer of the belladonna alkaloid.—*The Pharmaceutical Journal and Transactions*, June 8, 1889.

CASES OF WILD PARSNIP POISONING.

At the meeting of the Maine Medical Association, recently held at Portland, DR. G. A. PHILLIPS reported several cases of wild parsnip poisoning (*Boston Medical and Surgical Journal*, July 4, 1889). Botanically and in physiological action this plant resembles the water-hemlock. It is the *Pastinaca sativa* of Gray.

The poison takes effect in direct ratio to the rapidity of the digestive powers in children, about two hours after the ingestion of the root. The symptoms are flushing of the face, mental dulness, followed soon by twitching of the extremities and severe convulsions, with coma, pupils widely dilated, respiration shallow, pulse weak, rapid, and thready, tongue dry and swollen. Treatment was by opium and prolonged etherization, after emetics and enemas.

Death occurs in cases not promptly relieved. Strong infusion of the root injected under the skin of a cat had no other effect than to widely dilate the pupil.

A CASE OF POISONING BY NITRO-BENZOLE.

DR. REYNOLDS reports the following case: F. O'B., aged 25, was brought to the Manchester Infirmary at 6.50 P.M. on March 19. He was quite unconscious, and of intensely blue color, and all that was known about him was that he was employed at some aniline-works, and that he had been sent home that morning sick, with instructions that he was not to be allowed to go to sleep. The case was recognized to be one of poisoning by nitro-benzole, and the patient was at once admitted, when the following note was taken: "The patient lies easily on his back, and is quite comatose, appearing, however, rather as if in a deep sleep. On applying a strong faradic current to the face he responds merely by a few grunts and grimaces. All the limbs are flaccid and helpless, the tendon reflexes being increased in some measure. The extraordinary feature of the case is the most intense blueness of the whole body, particularly the hands, feet, face, and mouth. The eyes are closed, the pupils normal, reacting to light. The pulse is 100, regular; the respirations quiet, 32, markedly Cheyne-Stokes in character. The breath has an odor exactly like that of aniline oil, but not at all like that of almonds." His face was then touched, when he at once aroused and asked where he was, the Cheyne-Stokes breathing disappeared, and the respirations increased to 42. He complained of great drowsiness, and of an intense dull, aching pain in the head, and a feeling of a heavy weight in the stomach. The blueness remained as before. He did not sleep well that night, owing to the headache, but was better next morning. On the following day he was much better, and able to go out; the cyanosis was slight; he still had some headache and anorexia. The urine was high-colored, turbid, specific gravity 1032, containing an excess of urea and a trace of bile, but no albumen, and no blood or globulin. He stated that he had been employed at the works for seven weeks, and that on March 16 he began to make picric. His duty was to heat and whizz a mixture consisting of nitric acid, carbolic acid, vitriol, and nitro-benzole, and the fumes from this mixture he constantly inhaled. On the 17th he felt sick, and had pains in the stomach and head, and the next day he was worse, and could hardly walk home. On the following day he was much worse, and the doctor came to see him, and gave him a quart of new milk and two eggs, and sent him home, telling him not to go to sleep. He did go to sleep in the afternoon, and in the evening, as already stated, was brought to the hospital.—*London Medical Recorder*, May 20, 1889.

A MODIFICATION OF DR. JEFFRIES'S BREAD FOR DIABETICS.

Dr. John A. Jeffries published in the *Boston Medical and Surgical Journal* for January 24 the following formula for a new diabetic bread:

"One cup of graham flour; one cup of best bran, previously scalded with one cup of boiling water; two eggs; German yeast or baking-powder; salt to taste; one cup of milk or water. To be mixed with a spoon.

Such a bread contains 17.72 per cent. of starch, the equivalent of 19.68 (?) per cent. of sugar."

In the *University Medical Magazine* for June, 1889, DR. JAMES TYSON states that he had recently under his care a case of diabetes where the sugar was eliminated by a selected diabetic diet, from which bread was excluded, and it occurred to him to make a trial of this modified bread. Accordingly some was made after this formula. At the end of one week the urine was found to contain between one-half per cent. and one per cent. of sugar. It then occurred to him to modify the formula by substituting the gluten flour of the Health Food Company of New York for the graham flour, mixing it with bran as before. At the end of another week the urine was found to contain about one-quarter of one per cent. of sugar. The patient was then taken off of all bread, and at the end of another week sugar had disappeared from the urine, showing that this combination, as was to be expected, was better than the former. The bread thus modified was quite palatable.

ARTERIAL MURMUR.

DR. SIDNEY PHILLIPS terminates a long article, published in the *Lancet* for May 18 and May 25, with the following conclusions:

Conclusions.—1. A murmur is sometimes audible in the subclavian artery immediately below the clavicle, which is not the result of organic disease or of pressure upon the artery, and is most common in anæmia and other conditions where there is defective adaptation of the arterial wall to the blood-current. 2. The various circumstances influencing the production and rhythm of the subclavian murmur are dependent on its anatomical position and the respiratory movements. 3. Murmurs may be often heard in anæmia in the large branches of the aorta within the chest. 4. The respiratory movements have a marked influence on the characters of anæmic murmurs in arteries arising within the thorax. 5. The murmurs heard in the subclavian and pulmonary regions in some cases of phthisis, inasmuch as they may exist without phthisis, must not be regarded as diagnostic of that disease, and are not produced by pressure of consolidated lung in most cases where they coexist with phthisis. 6. Murmurs may be originated in intra-thoracic arteries from traction upon them by the displacement of the heart in pleuritic effusion.

THE PREVENTION OF THE SPREAD OF CONSUMPTION.

The Health Department of New York City have formulated the following rules, based upon the conclusions arrived at by a committee of physicians and pathologists of that city:

Pulmonary tuberculosis (consumption) is directly communicated from one person to another. The germ of the disease exists in the expectoration of persons afflicted with it. The following extract from the report of the pathologists of the Health Department explains the means by which the disease may be transmitted:

Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by breathing air in which living germs are suspended as dust. The material which is coughed up, sometimes in large quantities, by persons suffering from consumption contains these germs often in enormous numbers.

This material when expectorated frequently lodges in places where it dries, as on the street, floors, carpets, handkerchiefs, etc. After drying in one way or another, it is very apt to become pulverized and float in the air as dust.

By observing the following rules the danger of catching the disease will be reduced to a minimum:

1. Do not permit persons suspected to have consumption to spit on the floor or on clothes unless the latter be immediately burned. The spittle of persons suspected to have consumption should be caught in earthen or glass dishes containing the following solution: corrosive sublimate, 1 part; water, 1000 parts.

2. Do not sleep in a room occupied by a person suspected of having consumption. The living rooms of a consumptive patient should have as little furniture as practicable. Hangings should be especially avoided. The use of carpets, rugs, etc., ought always to be avoided.

3. Do not fail to wash thoroughly the eating utensils of a person suspected of having consumption, as soon after eating as possible, using boiling water for the purpose.

4. Do not mingle the unwashed clothing of consumptive patients with similar clothing of other persons.

5. Do not fail to catch the bowel discharges of consumptive patients with diarrhœa in a vessel containing corrosive sublimate 1 part, water 1000 parts.

6. Do not fail to consult the family physician regarding the social relations of persons suffering from suspected consumption.

7. Do not permit mothers suspected of having consumption to nurse their offspring.

8. Household pets (animals or birds) are quite susceptible to tuberculosis; therefore do not expose them to persons afflicted with consumption; also, do not keep, but destroy at once, all household pets suspected of having consumption, otherwise they may give it to human beings.

9. Do not fail to cleanse thoroughly the floors, walls, and ceilings of the living and sleeping-rooms of persons suffering from consumption at least once in two weeks.

THE TONSILS IN PHTHISIS.

Dr. Dmokhovski publishes in a Polish medical journal—the *Gazeta Lekarski*—some important observations on the condition of the tonsils and the follicular glands at the base of the tongue in phthisical subjects. Strassmann had previously made some observations on the tonsils, and had found them affected in thirteen cases out of twenty-one which he examined. Dr. Dmokhovski was able to show some affection of the tonsils in every one of the fifteen cases examined post mortem, the lymphatic glands at the base of the tongue being also affected in nine of these cases. The lungs were in every instance decidedly affected, and in five there was slight tuberculous ulceration of the larynx. The ages of the subjects varied from 18 to 56. Presumably the tonsils were infected from the mouth, the bacillary infection at first affecting the epithelial layers and subsequently the deeper tissues,—viz., the lymphatic sinuses and the follicles themselves. The tuberculous character of these changes was made manifest either by the existence of large disseminated collections of Koch's bacilli, or by the concomitant signs of general inflammation of the connective tissue, or by the occurrence of fully developed tubercles. These showed themselves first of all in the connective tissue between the follicles along the lymphatic vessels leading to neighboring cervical lymphatic glands. Ulcerations of the tonsils were observed in the crypts, but never on the free surface of the glands; sometimes cavities were found in the tonsils. In the living subject no marked affection could ever be detected by the naked eye in the tonsils. The absence of disposition to external ulceration is explained by the supposition that the deeper tissues form a far more suitable soil for the development of the tubercle-bacilli than the superficial tissues,—that is, the mucous membrane covering the surface of the gland.—*Lancet*, June 22, 1889.

VARICOSE VEINS OF THE LOWER EXTREMITIES.

Mr. William H. Bennett terminates a lecture, delivered before St. George's Hospital Medical School, with the following conclusions (*Lancet*, June 1, 1889): 1. That, discounting the influence of pregnancy, the tendency to the development of varicose veins in the lower limbs is greater in men than in women. 2. That the disease for the most part arises from congenital and often hereditary defect or other abnormity in the venous apparatus, there being no evidence to show that a vein originally perfect (excepting perhaps the long saphena) ever becomes varicose before middle age, in the absence of such obvious causes as those previously referred to. 3. That two distinct classes of the disease exist,—one beginning in the deep veins, and subsequently involving the superficial; the other affecting the superficial veins only, usually the long saphena and its radicles, and being confined almost entirely to tall subjects. 4. That the large mass of varicose veins in the lower part of the thigh, often associated with a globular varix at the saphenous opening, may, in many cases, although apparently connected with the long saphena, be independent of it, being fed for the most part by veins coming through the fascia from the deeper parts of the limb,—a point worthy of consideration in the treatment of these cases.

PILOCARPINE IN THE CONVULSIVE ATTACKS OF HYSTERO-EPILEPSY AND MANIACAL EXCITEMENT.

In the *Journal of Nervous and Mental Diseases*, No. 4, 1889, Dr. Samuel B. Lyon reports the case of a married woman, aged 30, in whom the convulsive seizure had the characteristics of hystero-epileptic attacks, who was relieved by a hypodermic injection of ⅙ grain of muriate of pilocarpine over the left ovary. Her temperature, which had been 103⅘°, fell to 101⅕°. The convulsive movement ceased, consciousness gradually returned, and a quiet sleep followed. In this case inhalations of amyl nitrite and ether had only temporarily quieted the spasmodic condition.

—THE—

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*NEW THERAPEUTIC AGENCIES.**

By Professor Dujardin-Beaumetz, Paris, France.

SUSPENSION IN LOCOMOTOR ATAXIA.†

GENTLEMEN:—Since the establishment of these lectures at the Cochin Hospital I have treated successively of New Medications, of Alimentary Hygiene, of Hygienic Therapeutics, and of Prophylactic Hygiene. I propose this year to return to my starting-point, and to examine the new medicaments and new medications.

In these times, so great and so rapid is the progress which is being made in all departments of therapeutics, that we shall find in the three years which separate my first from my second conferences on the same subject, a rich and ample harvest of new and interesting facts.

I shall begin with the new therapeutic agencies now being utilized in diseases of the nervous system. This subject I did not take up in my first series of lectures. I do it to-day, the more willingly from the fact that even in affections the most rebellious to treatment, we have certain useful therapeutic agencies of recent acquisition.

* A second series of "New Medications," published in 1887.

† From advance sheets, revised by the author (transted by E. P. Hurd, M.D.). Lectures delivered in in Hospital, Paris, France.

I shall begin with the study of the treatment of chronic affections of the spinal cord, and in two successive lectures I shall examine, first, suspension as applied to the treatment of tabes dorsalis, then the benefits which have been derived from the introduction of the new analgesics in the treatment of these affections. Do not expect of me a complete exposition of these new therapeutic agencies; these lectures will embody much more of personal experience than the preceding, and will set forth more particularly the results of clinical trials and experiments made in this hospital, and I shall leave unnoticed a great many similar facts published in foreign lands.

Within the past few years, the therapeutics of chronic affections of the spinal cord, and, in particular, of the systematized diseases of this nervous centre, have been enriched by precious acquisitions to which it seems fitting for me to call your attention, and I shall take especially for type of the chronic spinal diseases, locomotor ataxia.

Thanks to the contributions of the school of the Salpêtrière, and the impulsion given to that school by its eminent chief, Professor Charcot, our knowledge of the chronic affections of the cord has been greatly extended, and we have been enabled to construct an ever-increasing number of varieties and species.

Unfortunately, therapeutics has not made as rapid progress as clinical observation (*la clinique*), and this is readily understood when you think that at the time when the physician's services are demanded, the medullary alterations already exist. These lesions, which belong to the chronic sclerous inflammations, choke out the nervous elements, and thus produce irremediable disorders, before which therapeutics is powerless. Hitherto the treatment of these chronic interstitial inflammations has consisted principally of the following means: First, revulsion; here the introduction of the Paquelin thermo-cautery has enabled us by punctiform cauterizations to render this revulsion less painful and more easily applicable. In addition to the revulsion produced by fire or heat, there is that which is produced by cold. If the application of ice-bags along the vertebral column, according to Chapman's method, has been abandoned by reason of the complications supervening (pneumonia, grave bronchitis, etc.), it must be admitted at the same time that certain refrigerants, and, in particular, the chloride of methyl, have rendered some service, not so much in arresting the progress of the medullary sclerosis, as in alleviating the intense pain from which ataxic patients sometimes suffer.

The application of chloride of methyl has been perfected of late by the use of certain new instruments made to facilitate the external employment of this agent, as that of Galante. Improvements in the mode of its application have also been devised, as the *stypage* (method by *tamponment*),* introduced by Bailly.

I shall say but little of hydrotherapy, a subject which I have treated at some length in my Clinical Therapeutics† and in my Hygienic Therapeutics. This is a method of treatment which needs to be managed with extreme prudence in the chronic diseases of the spinal cord, and we have often witnessed under the influence of a douche at too low a temperature or too high a pressure, aggravations in the state of tabetic patients.

If, then, in certain cases of non-congestive medullary affections, in which the neuropathic state predominates rather than any sclerous alterations, clinicians have seen cold percutient douches give good results, it is better to recommend, for the truly tabetic, tepid, and even warm douches at a low pressure.

As for the internal treatment, it comprehends strychnine, ergot of rye, nitrate of silver, and phosphorus. Strychnine is the most dangerous medicament which we can employ in tabes dorsalis, and even in all diseases of the cord with lesions. By causing congestions of the cord, it augments the phlegmasic process, therefore it ought to be altogether discarded from the therapeutics of medullary affections. It was as a result of Brown-Séquard's labors that the medical profession came to employ ergot in affections of the spinal cord; the considerations on which are based the administration of this remedy are rather theoretical than practical, and I do not know that there exists a single observation where the employment of ergot of rye has given positively good results.

Vulpian and Charcot, in 1862, proposed nitrate of silver in the treatment of medullary affections, as Wunderlich had already done in 1861. This is a kind of treatment which is absolutely empirical, though still in use by Professor Charcot. I confess that

* The methyl chloride is applied on little wads of cotton (see *Semaine Médicale*, 1888, p. 35).—Tr.

† "Clinical Therapeutics," Detroit ed., chap. on "Hydrotherapy."

the results which I have obtained therefrom are more than doubtful, and the benefits which are derived from this treatment do not make amends for the gastric and intestinal irritation which follows the administration of this medicament.

I may say as much for the phosphorus treatment, which I myself proposed twenty years ago. I recommended at this time the administration of this drug to combat the medullary scleroses, and you will find in the thesis of my pupil, Dr. Eugène Lamaire, a report of most of the results obtained. Under the influence of phosphide of zinc or of phosphorated oil, ataxic patients seemed to have more force, more security in walking, less pain. But we must make all due account of the natural course of the disease, in which we see spontaneously supervening periods of calm and quiescence; and we must also recognize the influence exerted by phenomena of hypnotic suggestion, which always manifest themselves in affections of long evolution and whenever a new remedy is employed.

In connection with the consideration of the internal treatment, I ought to remind you of the advantages which have been claimed from antisyphilitic treatment in the ataxic. Professor Fournier, in showing us that the greater number of victims of tabes dorsalis are syphilitic, and in insisting on the preataxic phenomena which manifest themselves in advanced stages of syphilis, has given us hints which might seem to be of very great value in the treatment of tabes. But if clinical observation has confirmed the dictum of the professor of Saint-Louis, it must be admitted that few patients have been able to derive profit from this indication. While we, in fact, see syphilitic paraplegias greatly relieved, and even completely cured, under the influence of an intensive specific treatment, this is not the case with locomotor ataxia, and however rigorously you may carry out an antisyphilitic treatment, you obtain no beneficial result. The reason of this fact is easily understood. When the tabetic symptoms appear in syphilitic patients, the connective-tissue lesion has already been produced, and all kinds of treatment are powerless against this lesion. At the same time, it must be admitted that if medical interference is possible at the onset and at the preataxic periods, you will sometimes be fortunate enough—not to cure the patient, but to prevent the further progress of the disease.

I come now to the new therapeutic agencies. They pertain almost exclusively to the two following modes of treatment: 1, extension by suspension; and, 2, to the internal administration of the new antithermic analgesics.

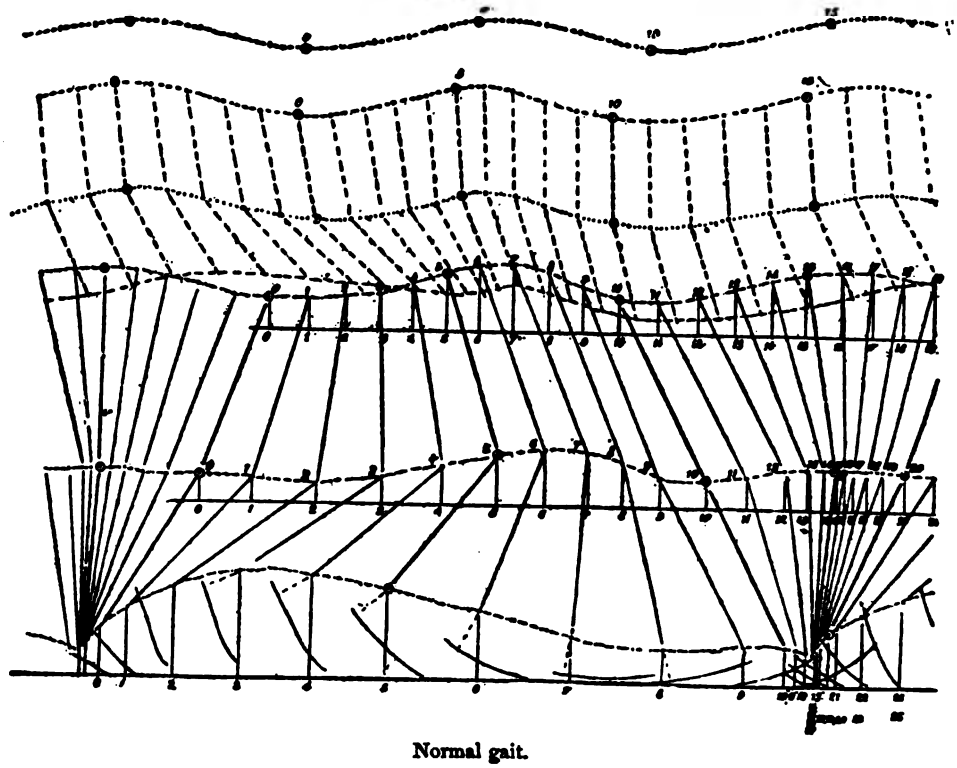
Many years ago extension was recommended in the treatment of tabes. To combat certain neuralgias, it had been proposed to practise nerve elongation, and Billroth and Nussbaum had advocated this method, to which Fornari had given the name of *neurectény* (nerve-stretching); and I remember to have seen Verneuil in 1876 apply this elongation to the treatment of tetanus. It is sufficient to refer to the labors of Langenbuch, of Weiss in Germany, of Varnots in Belgium, and of Chauvel and Duvault in France, in order to appreciate the value of this method. In the memoir of Chauvel, out of fifty-two cases of neuralgia treated by stretching, there was a complete cure in thirty. Then this elongation was applied to the treatment of ataxia. It was in 1869 that Langenbuch made the first application, which was the following year repeated in France by Debove and Giliette.

The operation of stretching the sciatic nerves for tabes has been abandoned, and this for two reasons: First, on account of the short duration of the amelioration; second, because, as a sequel of these stretchings, there had been observed trophic disturbances of great gravity. This method comes back to us to-day under another form, that of suspension, and this time the results seem much more favorable.

When Dr. Raymond, after his visit to Russia, had made known in France the mode of treatment of Professor Motchoukowski, of Odessa, this method was at once put in practice at the Salpêtrière under the direction of Professor Charcot, and I have myself applied it to patients in my wards at the Cochin Hospital. Out of the twenty-five patients who have been subjected to this mode of suspension, we have obtained good results in the most of them, and in four a real improvement in the walking was observed. In order to estimate this improvement, we made use of the method of Marey. Quenu and Demény, aided by my pupil Burais, have cleverly given us photographic tracings, which will enable you to judge of this amelioration. (Figs. 1, 2, and 3.)

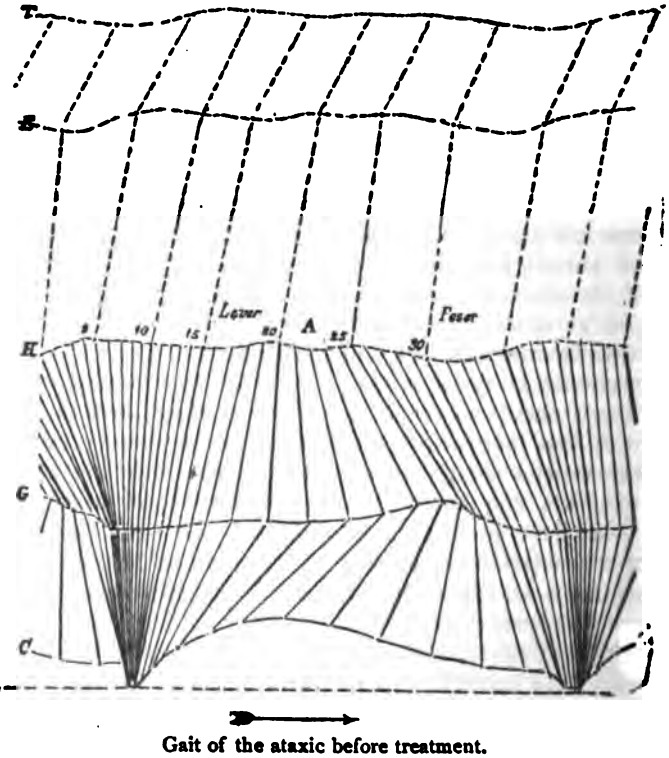
You know how Marey and Demény proceed in the obtention of these tracings. The patient is dressed in black, and walks in front of a black background; electric lights are placed at the head, the shoulder, the hip, the

FIG. 1.



Normal gait.

FIG. 2.



Gait of the ataxic before treatment.

knee, and the tibio-tarsal articulation, and a photographic apparatus, which enables one to take proofs in fractions of a second, reproduces these luminous points, which only have to be united by lines in order to have a perfectly exact representation of the gait of the patient.

In comparing these different draughts with those obtained in patients whose gait is normal, we have noted an undoubted amelioration following suspension in four of our patients.

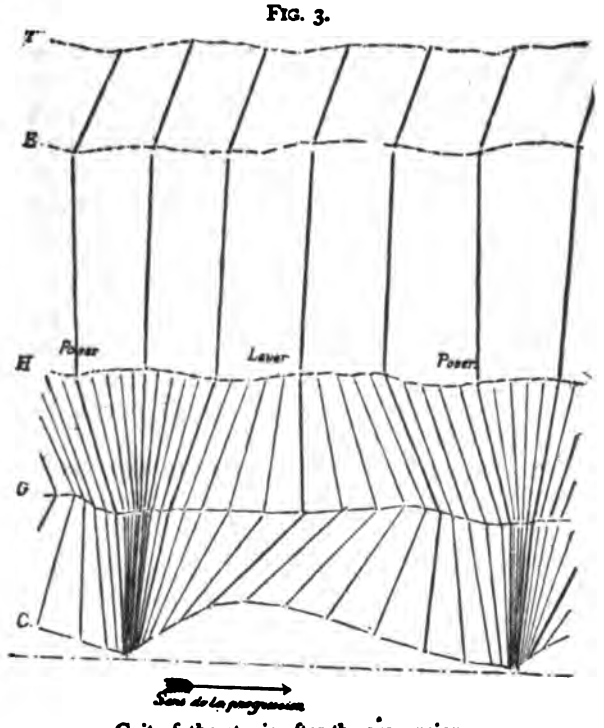
You can judge of this amelioration by the tracings given above. In Fig. 1 you have a representation of the normal gait; in Fig. 2 you have the gait of the patient before suspension; while Fig. 3 gives that of the patient after fifteen days of suspension, and you can judge of the benefit which has been derived from this mode of treatment, as far as walking is concerned.* For more particulars on this point I shall have to refer you to the communication made to the Academy of Sciences by Demény and Quenu, "On Locomotion in Locomotor Ataxia," which was read before the Academy, May 7, 1889, in which you will find an exposition of all that pertains to the peculiarities of the ataxic gait.

However, this improvement, which is especially apparent in the first fortnight of the treatment, soon ceases, and the patient's condition becomes stationary. Six of our patients have derived no benefit from the method; but, on the whole, the results have been sufficiently favorable to warrant us in continuing the practice of this method as occasion may indicate. I may add that we have never seen any serious harm result from it. At the same time, in the case of one of our patients, suspension, even of very short duration, produced fainting; in another, the pain was so severe that we were obliged to discontinue this mode of treatment.

Goreki has recently reported a case of death from suspension; in this case no physician was present. The patient was a paraplegic, who had caused himself to be suspended by his own domestic, and we are completely ignorant of how this suspension was accomplished.

Other cases of death have been mentioned in foreign journals; they were all the result of this fact, that the patients either suspended themselves, or caused themselves to be suspended by their attendants. Thus, Vincent, of New York, has mentioned the case of a patient who was strangled by reason of a

FIG. 3.



Gait of the ataxic after the suspension.

* In the figures, the capital letters T, E, H, G, C refer respectively to the head, shoulders, hips, knees, and ankles, which are the illuminating points. The words *lever* and *poser* are designed to indicate respectively the up-and-down movements of progression. The arrow shows the direction of the progression.—TR.

giving way of the straps supporting the arms. Another physician of New York is said to

FIG. 4.

have fallen into a coma, and died at the end of twenty-four hours.* These are facts which it will not do to forget; they show clearly the danger which there is in leaving patients at liberty to treat themselves.

The *modus operandi* is very simple. Sayre's apparatus is the one used. The two figures here given show how this suspension apparatus is applied. (Figs. 4 and 5.) The patient is suspended at first thirty seconds, then for three minutes. I do not advise to go beyond this figure. It is well understood that it is not necessary absolutely to lift the patient from the floor; it is sufficient that the tips of the toes shall touch the floor. The face becomes congested, sometimes cyanosed, and you ought to be always ready to lessen the traction if the patient begins to be distressed.

It will never do to allow patients to undertake the suspension for themselves, as they always have a tendency to overdo it. Nor ought the physician to have recourse to this treatment every day; every other day is often enough.

I have also made trials in my service of

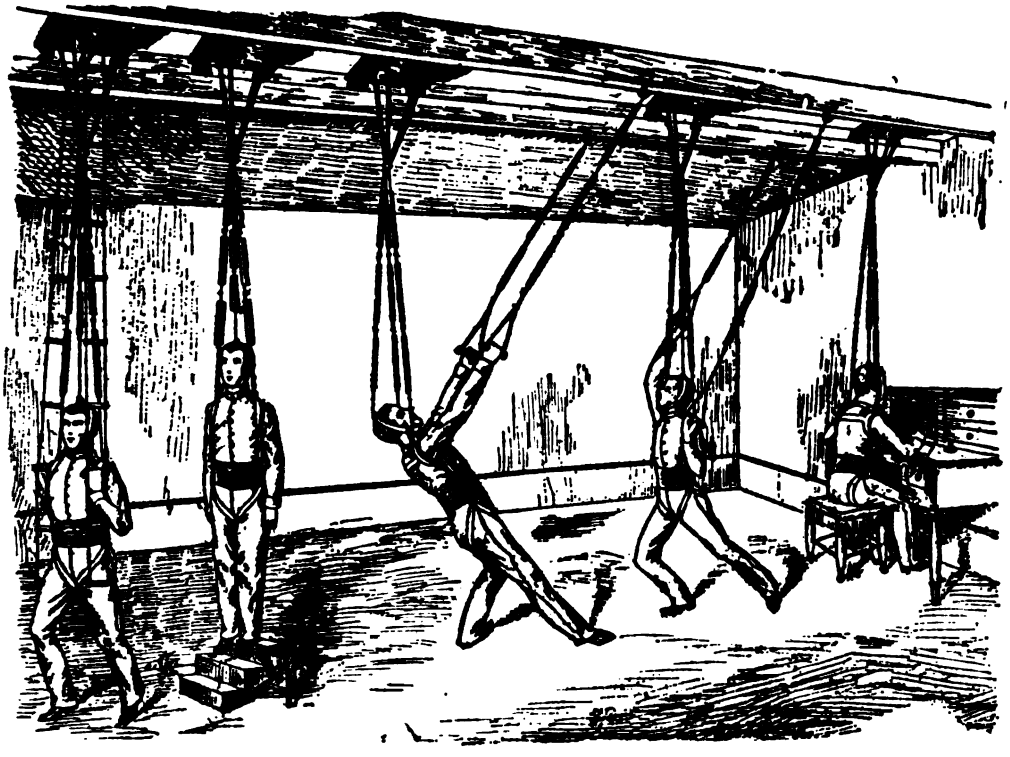
FIG. 5.

Pichery's method, in which suspension is combined with opposition-gymnastics. In the system of Pichery, an apparatus furnished with elastic cords and well-padded rings which constitute the essential feature o

* *N. Y. Med. Journ.*, May 18, 1889.

this kind of gymnastics,* enables the ataxic patient to execute movements more or less co-ordinated of the upper and lower limbs, at the same time that he changes his position. The following figure will give you a general idea of this apparatus. (Fig. 6.) When the patient has executed these movements for ten minutes or a quarter of an hour, suspension is practised upon him.

FIG. 6.



In true tabetic patients this kind of gymnastics is not beneficial; it will not do, in fact, to forget that prolonged fatigue is always bad in these patients by reason of the medullary congestions which it entails. The ataxic expends considerable force in walking, and it will not do unduly to increase this expenditure by gymnastic practices.

On the contrary, Pichery's method should be employed in false ataxia,—*i.e.*, in all the disorders which arise in the course of functional neurataxia or hysteria; and in our hospital wards you can see a good example of this in a patient who, after being affected with hysterical paraplegia, has been effectually cured by these combined means.

Almost all experimenters who have repeated the experiments of Motchoukowski, have, like him, made use of Sayre's apparatus, or some modification thereof. At the same time, I ought to mention the clever modification devised by Dr. S. Weir Mitchell, and described in a recent number of the *Medical News*.†

Although the suspension is generally from the head and chin, you will see from the figure which I here show you (Fig. 7), that, ac-

* See the THERAPEUTIC GAZETTE, vol. for 1887, 535.

† Dr. S. Weir Mitchell's method is described in the *Medical News*, April 13, 1889. The apparatus consists of two leather slings for the elbows; a band confines the arms to the waist. The patient is suspended partly by the head and partly by the elbows. To distribute the pressure upon the arms and trunk, the vertical straps are widened under each elbow to about four or five inches, and reinforced with leather. Sweeping round from the front to the back upright is a wide band, which comes against the outer aspect of the upper arm, yet leaving the point of the elbow free from contact. From one elbow leather to the other, and securely riveted to each, both across the front and back, pass stout straps, adjusted each by a buckle. Again, across the upper part of the chest, another strap, encircling the trunk, gives additional support.

The adjustment of the head is effected by a double pulley, or by a simple mechanism, thus: To the ring of each cheek-piece is attached a stout cord, which passes over a hook dependent from the large metal cross-bar, and thence by a strap inserted in a buckle made fast to the rear-elbow leather, one on each side. These hooks are about fourteen inches apart. With this mechanism the patient can be raised from the ground by the elbows, and then it is easy to adjust the amount of pull needed for his head.—TR.

cording to this process, the suspension is made in two periods. In the first the patient is suspended by straps passing under the elbows, and in the second by tractions on the head.

FIG. 7.

S. Weir Mitchell's apparatus.

Dr. Mitchell affirms that by this process he can maintain suspension for more than twenty minutes without inconvenience. Moreover, this method is less painful than other methods, from the fact that compression of the vessels and nerves of the axillary space is avoided.

Our patients have always, as a rule, borne suspension well; in almost all it has produced a sensation of heat and of congestion about the loins and lower extremities. In some of them, however, suspension has been so painful that we have been obliged to discontinue this mode of treatment.

This leads me to speak of the contra-indications for suspension. In general, all patients who are very feeble, whatever may be the cause of their enfeeblement, are poor subjects for this treatment. This contra-indication becomes absolute when you have to do with arterio-sclerosis and organic heart-disease. There is reason, in fact, to fear that the method of Motchoukowski may produce ruptures of blood-vessels and hemorrhages that will compromise the life of the patient, and Bloch has placed much emphasis on facts of this kind which have been witnessed.*

What are the results which suspension has given? From January 15, 1889, when Charcot made known the results of his treatment by suspension, to the 15th of last March, he reckons one hundred and fourteen cases of suspension, three of which were women; sixty-four of these cases should be reckoned out, as the observations were not sufficiently complete. Of the fifty remaining cases, thirty-eight were notably improved, and in twelve the treatment utterly failed.

Eulenburg and Mendel, in the statistics which they have published, show that in forty patients subjected to suspension, thirty-four were tabetic, the rest being affected with multilocular sclerosis, with paralysis agitans, etc. In the case of those who were suffering from other diseases than tabes, no result was noted; and of the thirty-four cases of locomotor ataxia, only twenty-one were followed up. These gave notable improvement in four instances, in twelve there was considerable improvement, and in five there was complete failure. These figures have a marked resemblance to those which I have obtained.

Morton, in six ataxic patients, has seen beneficial effects. Hammond has witnessed satisfactory results in five patients. Dana,† who has tried suspension in six cases, reports favorably.‡

Suspension has not been applied to locomotor ataxia alone. Other nervous diseases have been treated by this method. Thus, it has been tried in cases of spasmodic paralysis, of paralysis agitans, of Friedreich's disease, of transverse myelitis, etc. In some, suspension has given favorable results, in others none. One of the most remarkable instances which I have seen was obtained by my colleague, Chauffard, on one of my old patients whom I had sent to an infirmary. This boy was affected with convulsive tabes and spinal epilepsy; he was

* Bloch, *Bulletin Médical*, June, 1889, p. 728.

† *New York Medical Record*, April 13, 1889.

‡ *Treatment of Tabes by Suspension.*—Bernhardt (*Deustch. Med. Wochenschr.*, 1889, No. 21) has, during the last quarter of a year, treated nineteen patients, with about two hundred and twenty suspensions. Most of these were tabetic patients, some of whom had received more than twenty suspensions, others between fifteen and twenty. By all, even the very ataxic, the treatment was well borne. Apart from the beneficial psychic effect on the patient of a new method of treatment, there was an indubitable improvement in nearly every case. Some, it is true, stated that they felt no better, but in the majority Bernhardt recorded amelioration of the lancinating pains, increased ability to walk, diminution of the ataxia, increased vesical power, in some cases a decided influence on the lost sexual power, and in nearly all an improvement in the general condition.—TR.

unable to walk, and suffered horrible pains in his limbs. He has been to see me recently; the most of his symptoms have disappeared, and to-day he is practically well.

How does suspension act? The only explanation which can be given is that it acts as a process of stretching, the lower limbs making counterpoise to the traction exercised on the upper part of the cord by the suspension. In this sort of elongation, it is chiefly upon the posterior part of the cord, and on the vessels which supply it, that the stretching is exercised. This brings about a modification in the nutrition of the cord, and, in particular, in that of the posterior columns. Thus may be explained the amelioration which is obtained in systematized sclerosis of the posterior columns.

If this explanation is the true one, and if really the suspension acts by the elongation which it produces, it seems to me that we ought to modify this empirical method, and give it a more scientific character, for in the operation we are utterly ignorant of what traction we effect upon the cord, and, according to the height of the individual, his degree of stoutness and his weight, this traction must be more or less great. It would be desirable, then, to measure by the dynamometer both the traction which is produced on the upper part and that which is made on the lower part of the cord; and we might thus appropriate to therapeutic ends the method of torture which the ancient engravings have handed down to us, where we see the miserable wretches suspended with heavy weights at their feet.

We might thus, by attaching the feet of the ataxic patient to a dynamometer fixed to the ground, and by connecting another dynamometer with Sayre's apparatus, estimate what traction is effected on the extremities of the body. Hammond has already fulfilled one of these indications by applying the balance to the study of suspension, and in the beginning of the treatment he employs a weight of seventy to one hundred pounds.

To sum up, then, I believe that we are warranted in the conclusion that if suspension is not a curative method in ataxia, it is a method which relieves a certain number of patients, and may even bring about a notable improvement in walking in some of them, and, in certain extremely rare cases, may effect a relative cure; it is, then, a method which deserves to be kept in use, and this especially by reason of its harmlessness. In the next lecture I shall examine the benefits which have been realized in the treatment of ataxia by the employment of the antithermic analgesics.

THE PHYSIOLOGICAL ACTION AND THERAPEUTICAL VALUE OF APOCYNUM CANNABINUM.

BEING A THESIS READ FOR THE DEGREE OF M.B. IN THE UNIVERSITY OF CAMBRIDGE, ENGLAND.

By George R. Murray, B.A., M.B., Cant.; M.R.C.S., L.R.C.P., Lond.*

APOCYNUM CANNABINUM, Canadian or American Indian hemp, though not officinal in England, is placed in the United States Pharmacopœia.

It is a perennial plant, which grows in fields and near the edge of woods in many parts of the United States.

The root, in which lie the medicinal properties of the plant, is horizontal, slightly branched, several feet in length, and a quarter and half an inch in thickness. It breaks with a short fracture, and has no smell, but the taste is bitter and disagreeable.

Analyses of this root were made as long ago as 1833 by Drs. Knapp and Griscom, who found that it contained gallic acid, tannin, starch, gum, wax, and resin. They failed, however, to isolate any active principle.

In 1879, J. N. Lloyd, after allowing a fluid extract of the root to stand, obtained crystals of cane-sugar and a precipitate of white, waxy matter.

Schmiedeberg, in 1883, isolated two active principles,—apocynin and apocynein,—similar in their properties to digitalin.

This drug has been used considerably in America, where it was said to be a powerful diuretic in cases of dropsy, and especially in renal dropsy. It has many other properties attributed to it; thus, it acts also as an emetic and purgative, and is said to act as a diaphoretic, when it produces vomiting. It promotes expectoration, causes drowsiness, increases the flow of urine, diminishes the force and frequency of the pulse. It is said to be tonic and alterative, and is even accredited with the power of destroying intestinal worms and curing mild cases of intermittent fever. Stillé and Maisch, who mention these various properties of the drug, consider that "probably it is a mere evacuant of dropsical effusions. . . . There can be little doubt of its

* Late House Physician University College Hospital.

possessing this value in common with jalap and other hydragogue cathartics."

Dr. Lewis published in the THERAPEUTIC GAZETTE seven cases of pleurisy with effusion which were treated with apocynum. In all these cases the fluid subsided rather quickly when the apocynum was given. In cases of this kind the effusion so often disappears rapidly when no special treatment is adopted, that it becomes very difficult to estimate how much of the improvement is really due to the drug. I have not seen any such cases treated with apocynum, and so have no personal experience of its action on pleuritic effusion to record.

Dr. J. S. Dabney maintains that apocynum is one of the best diuretics and hydragogue cathartics that can be employed in Bright's disease, as it not only causes marked diminution in the anasarca, but also lessens the amount of albumen and casts in the urine. The special advantages he claims for it are—

1. A small quantity only is necessary to produce diuresis, emesis, or catharsis.

2. It has an agreeable aromatic taste.

3. It has tonic properties.

4. Its harmlessness, from emesis resulting from an overdose.

Dr. Ringer tells me that a few years ago he tried apocynum as a diuretic in Bright's disease, but found that it did no good. In one case of acute Bright's disease, which I watched carefully, tincture of apocynum, given in 10-minim doses four times a day for nearly a fortnight, caused no definite increase in the quantity of urine passed, and did not improve the condition of the patient at all.

Another patient, with chronic Bright's disease and cirrhosis of the liver, with ascites, took 20-minim doses of tincture of apocynum four times a day for several weeks. It did not increase his urine nor diminish the albumen, and his abdomen had to be tapped once or twice during the time he was taking the medicine. He maintained, however, that it did him good. This relief probably was due to the fact that the apocynum produced two or three rather loose stools each day. Any other purgative might have done the same.

It may be mentioned here that in neither of these cases, in both of which the heart was healthy, did the apocynum cause slowing of the pulse.

So far, then, as our experience goes in this country, apocynum does not act as a diuretic in the class of cases of dropsy in which American authors found it useful.

Some experiments have recently been made by Dr. J. Rose Bradford to ascertain the physiological action of apocynum. He has most kindly allowed me to quote some of the results he has obtained from his experiments on animals. In two of these experiments he used a tincture of the root, 1 in 10 of proof spirit. The same preparation was used in the treatment of the cases quoted.

Dr. Bradford finds that the principal action of apocynum is on the heart. The heart of a dog is slowed down to a very remarkable degree, for when it is well under the influence of this drug it beats as slowly as two beats to each respiration, or even three beats to every two respirations. This is a much more powerful effect than can be produced experimentally with digitalis. For before this amount of slowing is reached, the vagus becomes paralyzed, and the heart beats more rapidly and irregularly.

Apocynum strengthens the heart's beat and increases the tonus, so that it stops the frog's heart in systole. It generally stops the mammalian heart in diastole, but a sudden massive dose may stop the mammalian heart in systole. It may further be noticed here that clinically we find that it regulates the action of an irregular heart.

From this it is evident that the action of this drug on the heart is similar to that of digitalis, strophanthus, adonidin, caffeine, and sparteine, only its power of slowing the heart seems to be greater than in the other members of this group. Its action on the arteries, as shown by changes in blood-pressure, differs from that of digitalis. For Dr. Bradford finds that apocynum causes no definite rise of blood-pressure, indicating that it does not cause contraction of the arteries.

In its physiological action, as a whole, on the vascular system it resembles strophanthus more closely than digitalis, for it acts in a similar way to strophanthus on the heart, and, like it, does not cause contraction of the arteries.

Having thus briefly described the physiological action of apocynum, as shown by experiment, it will be well to consider theoretically the kind of case in which it may be expected to do good, and then to give such practical illustrations from some cases which were treated with it in University College Hospital. These cases, as well as those already mentioned, were all under the care of Dr. Ringer, who has most kindly allowed me to make use of them for this paper.

We will consider first its action on the heart alone.

From the similarity of its action to that of digitalis, we expected that it would be useful in cases of mitral disease.

In cases of mitral regurgitation, the backward flow of the blood through the mitral orifice may be due to four different conditions, which may occur singly or in various combinations.

If the mitral valves are shrunken and retracted by disease, they are no longer large enough to close the mitral orifice, and so the blood flows back into the auricle during the ventricular systole. In this case no drug can alter the condition of the valves themselves and prevent regurgitation.

When the left auricle and ventricle are weak and dilated, the auriculo-ventricular orifice is also enlarged. Under such circumstances even healthy valves would be unable to meet properly; if they are also retracted, a still greater amount of regurgitation takes place. Now, apocynum increases the tonus of the heart, and in this way lessens the size of its cavities. The mitral orifice is thus made smaller, so that the valves, if competent, are able to close the opening, or even, if incompetent, can lessen the amount of regurgitation to a considerable degree.

It has been shown by Professor MacAlister that the closure of the mitral valves is due in part to the efficient contraction of the left ventricle, consequently regurgitation may be due to incomplete contraction of a ventricle, with quite normal valves. If the valves are smaller than in health, the regurgitation is necessarily aggravated.

We have seen that apocynum increases the amount of contraction of the ventricle. By doing this it remedies any regurgitation which is due to imperfect contraction of the ventricle.

Dr. Ringer has suggested yet another way in which regurgitation may be produced. In mitral disease there is frequently irregularity of the heart, in consequence of which the papillary muscles do not act in concert with the walls of the ventricle, but pull back the valves at the wrong time, and thus allow regurgitation to take place. If the valves are insufficient, this inco-ordination must cause a further increase in the reflux of blood. This view is still further borne out by Dr. Brunton's observations. In cases of poisoning by digitalis, the heart becomes at last rapid and irregular. The irregularity is accompanied by a loud systolic murmur in horses, dogs, and man, which, he says, is most probably due to mitral or tricuspid regurgitation caused by irregular contractions of the columnæ carneæ.

Apocynum can obviate the regurgitation produced in this way by regulating and co-ordinating the action of the heart.

In any given case of mitral insufficiency, apocynum may be expected to remedy as much of the regurgitation as is due to any of the last three of the four cases mentioned.

The following case illustrates many of these points, and shows the rapid and efficient action of apocynum.

C. G., a woman of 58, was admitted to University College Hospital on January 1, 1889, complaining of "dropsy and heart-disease." She had been under treatment in the hospital two or three times before for the same conditions, and had greatly improved each time under digitalis, aided on one occasion by malleolar incisions.

PRESENT STATE ON ADMISSION.

General.—The patient is a stout woman of 58. She lies propped up in bed by pillows, as she can breathe more freely in that position.

The lips, cheeks, and ears are cyanosed, and the conjunctivæ are slightly jaundiced.

The feet and legs are swollen and œdematous.

The abdomen is enlarged, and measures forty-seven inches in circumference.

Circulatory System.—Symptoms.—Shortness of breath, and swelling of abdomen and legs.

Physical Examination.—Inspection.—There is slight bulging of the cardiac area, and all over it strong, heaving pulsation is visible, irregular in force and rhythm.

Palpation.—A fairly strong impulse is felt all over the cardiac area. The heart's apex beat can be felt in the fifth intercostal space four inches to the left of the middle line. The impulse given by the right side of the heart is strong and rather heaving in character. That given by the left side is shorter and less powerful. No thrill can be felt.

Auscultation.—At the apex both sounds of the heart are audible, and there is a loud, blowing, systolic murmur, which is conducted out into the axilla. No other murmur is heard, so that the mitral regurgitant murmur is the only one present.

Arteries.—The radial pulse is 130, irregular in force and rhythm, and low in tension.

Digestive System.—Appetite fairly good, bowels regular, tongue clean, but she complains of thirst and flatulence.

The abdomen is considerably distended, measuring forty-seven inches in circumference. The abdominal wall is tense and œdematous, and a distinct thrill is felt on tapping.

The lower edge of the liver can be distinctly felt four inches below the margin of the ribs.

The abdomen is resonant to percussion in front, but there is dulness in both flanks, which is diminished on the one side when the patient rolls over on to the other.

The urine is normal in character, and she passes sixteen to twenty-eight ounces in the twenty-four hours.

We thus have a fair typical case of mitral regurgitation, with a considerable amount of dropsy of the abdomen and legs, a weak, irregular pulse of low tension, and rather scanty urine.

On admission to the hospital on January 1 in this condition, she was put to bed and kept quiet. After she had been in the hospital for twenty-four hours she did not show any improvement from rest alone, as she had been kept in bed at home previously. She was then put on 5-minim doses of the tincture of apocynum every four hours. During that day (January 2) the pulse remained frequent, being 126 in the morning and 130 at night, and it maintained the same characters. She passed twenty-eight ounces of urine.

On January 3 the pulse fell in frequency to 102 in the morning and 114 at night, became less irregular, and there was more tension in it.

The quantity of urine increased to one hundred and three ounces for the twenty-four hours.

The dose of apocynum was doubled.

On January 4 the pulse had fallen to 96, the irregularity had still diminished, and the tension had increased.

The abdomen was less distended, and the cyanosis much less marked.

The urine was increased to one hundred and forty-seven ounces.

January 5.—The pulse was 94 in the morning and 86 at night. Only a slight amount of irregularity could be detected, and the tension was still further improved.

One hundred and seventy-nine ounces of urine were passed.

The patient was very sleepy during the day, and complained of nausea, so the 10-minim dose of apocynum was given four times a day instead of every four hours.

January 6.—The pulse was rather more frequent again, and varied between 90 in the morning and 106 at night, but maintained its good tension, and was only slightly irregular.

One hundred and twenty-seven ounces of urine were passed.

The nausea had gone, the ascites had diminished considerably, and the œdema of the feet and legs was less.

The apocynum was reduced to three times a day.

During the 7th, 8th, 9th, and 10th of January the pulse varied between 80 and 90, and one day went up to 100. The quantity of urine fell to thirty to fifty ounces of each day, this fall being doubtless due to the fact that nearly all the dropsical fluid had been run off, as during the preceding four days nearly twenty-eight pints of urine had been passed.

On the 9th the pulse was regular.

On the 10th she got up.

January 11.—The pulse was 80, rather irregular, but the tension was good.

During the 11th, 12th, and 13th the daily quantity of urine varied between thirty-one and forty-one ounces, and the pulse remained about 80.

On the 12th the medicine was given twice.

On the 13th once.

On the 14th the medicine was discontinued. The pulse was 81 in the morning 90 at night, the tension high, and scarcely any irregularity could be detected.

January 16.—Pulse 90; irregularity more marked than during the two preceding days. Twenty-six ounces of urine were passed. She was again put on 10-minim doses of apocynum three times a day.

During the 18th, 19th, and 20th the pulse varied between 82 and 92, only occasional irregularity could be detected, and the tension was high. Patient got up each day and walked about the ward. There was no nausea or purging.

This improvement was maintained till she left the hospital on the 24th.

The action of the drug on the pulse and flow of urine is best shown by placing them side by side in a table.

TABLE OF PULSE AND FLOW OF URINE.

Date.	Pulse. Morning.	Pulse. Night.	Ounces of urine for twenty-four hours.	Medicine.
January 1.....	.....	128	16	
January 2.....	126	130	28	Tinct. apocyni, ℥v, every four hours.
January 3.....	102	114	103	Tinct. apocyni, ℥x, every four hours.
January 4.....	96	96	147	" "

Date.	Pulse. Morning.	Night.	Ounces of urine for twenty-four hours.	Medicine.
January 5.....	94	86	179	Tinct. apocyni, ℿx, four times a day.
January 6.....	90	100	127	Tinct. apocyni, ℿx, three times a day.
January 7.....	88	88	47	" "
January 8.....	82	...	99	" "
January 9.....	81	...	50	" "
January 10.....	96	100	50	" "
January 11.....	80	...	41	" "
January 12.....	78	...	31	Tinct. apocyni, ℿx, twice a day.
January 13.....	...	...	41	Tinct. apocyni, ℿx, once a day.
January 14.....	81	90	14	Medicine stopped.
January 15.....	84	100	26	
January 16.....	90	92	36	Tinct. apocyni, ℿx, three times daily.
January 17.....	84	92	20	" "
January 18.....	82	88	29	" "
January 19.....	88	92	8	" "
January 20.....	84	...	18	" "
January 21.....	90	...	...	" "
January 22.....	84	90	...	" "
January 23.....	94	...	...	" "
January 24.....	...	...	...	" "

On reviewing this case, even one who has no great faith in the efficacy of drugs, must admit that apocynum had a rapid and unmistakably beneficial effect. The slowing action on the heart is shown by the fall of the pulse from 126 to 102 during the first twenty-four hours of the administration of the drug, and by its subsequent fall to between 80 and 90.

Its regulating action on the heart is shown by the rapid diminution in the irregularity of the pulse.

Its power in improving the strength of the heart's beat is shown by the increased size and strength of the pulse.

Its effect in improving the circulation as a whole is shown by the removal of the cyanosis and the rapid running off of the dropsical fluid by the kidneys.

It is also worthy of note that the diuresis began as soon as the improvement in the circulation became evident by the slowing and regulating of the pulse.

The rapidity of its action is shown by the slowing of the pulse to the extent of 24 beats, and the increase in the quantity of urine for the twenty-four hours from twenty-eight ounces to one hundred and three ounces during the first twenty-four hours of the exhibition of the drug.

The only effect produced on the digestive system was nausea on January 5, when she was taking 10-minim doses every four hours. This disappeared as soon as the number of doses was diminished.

We may next consider how apocynum may do good in cases of mitral constriction.

In the normal heart the auricle empties its contents into the ventricle during the ventricular diastole.

In mitral constriction the auricle is unable to empty itself through the narrowed auriculo-ventricular orifice in the same time, and so it becomes overdistended and thereby weakened. For it is a hydrostatic law that the pressure necessary to drive out the fluid contents of a hollow sphere is equal to the resistance to be overcome multiplied by the radius of the cavity. Both the latter factors are increased in mitral constriction, the resistance to be overcome is increased, and the mean radius of the cavity is made larger by the overdistention of the auricle. So the greater the distention of the auricle, or the narrower the mitral orifice, the greater the force required to empty the auricle.

Under these conditions apocynum can act in three ways.

It lengthens the diastole of the ventricle by slowing the heart; this necessarily gives the auricle more time to empty itself through the narrowed orifice.

By strengthening the auricular contraction it gives it more power to propel the blood onward into the ventricle.

The tonus of the auricle is increased, and its cavity is thus diminished in size. The auricle can then only contain a smaller quantity of blood, and has less to drive through the obstruction each time it contracts, the weakening due to overdistention being thus obviated.

In any given case these modes of action probably all come into play, but they are more easily understood if taken thus separately.

The following case of pure mitral constriction, which was treated with strophanthus, digitalis, and apocynum in turn, illustrate the action of the latter.

A. C., a girl of 21, was first admitted to University College Hospital on September 24, 1888, with shortness of breath, cyanosis, and clubbing of the finger ends.

On physical examination there was found a well-marked præsystolic thrill, running up to a strong cardiac impulse.

In auscultation a long, loud, præsystolic murmur was heard. The liver was enlarged, and she was occasionally jaundiced. She had a hard cough, with difficult expectoration of glairy mucus. Fine râles were audible over the lower part of the lungs behind. The pulse was regular, but varied between 100 and 120.

She took 10-minim doses of tincture of

strophanthus three times a day for about a week, but this did not slow her pulse, nor did it relieve her. She was then given digitalis. She improved most on doses of the latter, which were sufficient to slow the pulse down to about 80, the improvement being coincident with the slowing of the pulse. To do this it required 10 minims of the tincture six times a day.

On November 19 she left the hospital for six weeks. She returned on December 15 in much the same condition as on her first admission in September. Her pulse was 120.

She was put on tincture of digitalis, 10 minims, four times a day.

On December 19 this was increased to 15 minims four times a day.

On the 20th the pulse had fallen to 88, and the cough and dyspnœa were much less marked.

On the 26th the digitalis had to be discontinued on account of the vomiting it produced. After this the pulse did not exceed 100 till January 14, when it reached 114, but no special cardiac remedy was given till January 17, when the pulse was 120, and she was put on 10-minim doses of tincture of apocynum four times a day.

On the 18th the pulse was 96, she felt better, her cough had gone, and the jaundice, which had been present for the four preceding days, was less.

On the 19th the pulse was 80 to 90.

On the 20th the patient was much better; the cyanosis was considerably less; the jaundice also was diminished; pulse, 74: no vomiting or purging.

Next day patient left the hospital.

In this case the decided improvement which occurred when the pulse was slowed by digitalis came also when it was slowed by apocynum, showing the similarity in the therapeutical action of the two drugs on the heart.

The rapidity of its action is shown by the slowing of the pulse from 120 to 96 in the first twenty-four hours, and from 96 to between 80 and 90 in the next twenty-four, and to 74 on the third day.

The strophanthus caused no appreciable slowing in the pulse, and the digitalis had been taken for ten days, on the first occasion, and for four or five on the second, before it caused distinct slowing. No unpleasant effect was produced on the digestive system by the apocynum.

We may now consider lesions of the aortic valves.

In aortic obstruction, when there is efficient compensation, no medicine is required. If there is fatty or fibroid degeneration, apocynum could have no effect on the degenerated cardiac tissue. It would cause the remaining weak cardiac muscle to contract with more energy than it was able to maintain, and so in reality hasten its final failure. In cases where the heart substance is not degenerated, but the compensation is not complete, apocynum might do good in strengthening the beat. If, however, we can reason from what we know to be the effect of digitalis, and presumably also apocynum, on the right ventricle, under somewhat similar conditions, we should not expect it to be of much use.

In a case of emphysema the right ventricle has a certain abnormal amount of obstruction to overcome in driving the blood through the emphysematous lungs.

We will consider a case in which its reserve power enables it to fulfil its task properly.

If such a case has an acute attack of bronchitis, the obstruction in the lungs is greatly increased. All the reserve power of the right heart has already been called into play in overcoming the pre-existing obstruction. It is unable to overcome the increased resistance in the lung, and so becomes overdistended and weakened. Under such circumstances we should expect on theoretical grounds that apocynum would do good by strengthening the beat of the right ventricle and enabling it to overcome the obstruction. Clinically, we find that digitalis does not do good in this kind of case, nor probably would apocynum, though I have not tested it. This being the case, we must not expect much benefit from it in cases of aortic obstruction.

In aortic regurgitation, apocynum, by lengthening the diastole, would allow a longer time for the blood to flow back into the left ventricle, and thus increase the mischief. Its action in this direction would not be so great as that of digitalis, for it does not raise the blood-pressure, a factor which, in the case of digitalis, must tend to increase the regurgitation still further.

We must, on the other hand, remember that so great an authority as Dr. Balfour holds that digitalis in large doses is of great service in aortic regurgitation with deficient compensation, as it lessens the cavity of the ventricle by increasing the tonicity of its walls, thereby preventing dilatation.

If this be the case, apocynum may be able to do good in the same way.

In fevers, where the pulse is frequent and the heart is becoming exhausted by its rapid action, drugs which slow the heart, and especially digitalis, have been found to act beneficially. They lengthen the diastole, which is the natural resting time of the heart.

We may, I think, hope to find apocynum useful for this purpose on account of its very powerful slowing action.

I have notes of only one case in which it was given with this object in view.

It was a case of phthisis, with tubercular ulceration of the intestines, with a temperature which rose each evening to 102° F. or 103° F., and a rapid, feeble pulse, varying between 120 and 140.

On January 15, the pulse being 140, she was given 10 minims of tincture of apocynum three times a day.

On the 16th the pulse was 132 in the morning and 116 at night; was less compressible and fuller during diastole than on the preceding day.

On the 17th the pulse was 120 in the morning and 108 at night, and the improvement in tension was maintained. The dose was then doubled. This, however, increased the patient's diarrhœa, and so the medicine was discontinued.

In this case there was a little slowing of the pulse, but the treatment was not continued long enough to enable one to judge of its effects, and the case was an unfavorable one for trial, owing to the tendency to diarrhœa.

The purgative action of the drug would be unfavorable to its use in cases of typhoid fever with diarrhœa.

As to the action on the kidney, we have seen that in our experience apocynum is useless as a diuretic in case of dropsy due to Bright's disease.

The case of mitral regurgitation, given at length above, was a good illustration of its powerful action as a diuretic in cardiac dropsy. Now, we know that digitalis acts as a diuretic, mainly by improving the circulation and removing the causes which lead to the accumulation of dropsy, for it does not cause much diuresis when there is no dropsy.

We may consider, then, that apocynum acts chiefly in a similar way through the heart, and not as a local renal diuretic. This view is strongly supported by the evidence that its chief use as a diuretic is in cardiac dropsy; and, further, that the diuresis ceases as soon as the dropsy has all been run off, as in the case related above.

In the above description of the therapeutical action of apocynum, I have not described all the cases in which it was given. The total number of cases was small, and, I am fully aware that experience derived from only a few cases does not go for much in estimating the true value of a new drug which is on trial. I have, therefore, only related such cases as appeared most directly to illustrate the positive action of the medicine.

The chief drawback to apocynum is the effect it has on the digestive system in some cases.

In two cases it excited persistent vomiting, so that it had to be discontinued.

In two other cases it caused vomiting, but this passed off, though the medicine was continued.

In one case it aggravated the diarrhœa to which the patient was subject, and so had to be discontinued.

The history of most valuable medicines shows us that it often takes years for a new drug to find its own level as a therapeutical agent. A proper estimate of its true value can only be found by the analysis of a number of carefully reported cases of varying types and occurring under various conditions.

At present we cannot say what the true therapeutical value of apocynum may be, but I think that the above cases show that in it we have, at any rate, a powerful cardiac remedy. Whether it will in the long run prove superior to other members of the same group of medicines or not I am not as yet in a position to foretell.

In conclusion, it is my pleasing duty to express my best thanks to Dr. Ringer for allowing me to publish his cases, and also for much valuable advice for this paper, and to Dr. Bradford, who has so kindly allowed me to quote his unpublished experiments.

NEWCASTLE-ON-TYNE.

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*SULPHONAL.**

BY HENRY M. FIELD, M.D., NEWTON, MASS.†

AT once upon my return from medical lectures last year,—mid-October, 1888,—I was attracted to various clinical reports respecting the use, value, and safety of the

* Read before Sections of the New Hampshire and Vermont Medical Societies, at Dartmouth College, August 2.

† Professor of Therapeutics, etc.

new hypnotic sulphonal, presented by the last number or two of the THERAPEUTIC GAZETTE, which the mail had brought during my absence. And just here I would freely acknowledge the claim which this enterprising periodical has both upon my gratitude and my respect; from this source was the new and invaluable material first brought to my notice, and in its pages has been maintained up to the present what I believe to be the only correct spelling of its name.* Too hesitant as I may confess myself generally to be to prescribe a new drug, I found myself very strongly impressed by the arguments and representations adduced in support of sulphonal; and availed myself of the first opportunity offered to try its action. The venture was repeated again and again, to such extent that I was already in position to form some opinion of the merits of the new hypnotic before several of my most active neighbors in the profession had realized its existence. To-day, with a ten-months' record of nearly two hundred carefully-observed applications,—*i.e*, in as many different subjects,—given for longer or shorter periods, to "all sorts and conditions of men," I am prepared to claim that sulphonal "*has come to stay*," and to prove—at least this shall be my effort in the pages which follow—that *it has already asserted its right to stand first in the class of hypnotics.*

Almost from the first I have *pushed* sulphonal. In my moderate family practice I could not otherwise have had so wide an experience in its use. Moreover, I myself have tried the soporific probably as many as thirty times.

I repeat that I have rather pushed the remedy, and this for several reasons. 1. Some form or degree of insomnia is a frequent condition among my patients, consisting, as they do, chiefly of overburdened business-men and their no less burdened wives. 2. I was early impressed with the belief, and later was convinced, that sulphonal is as valuable, as indispensable an addition to our therapeutic resources as was chloral hydr. twenty years ago; and the latter, by way of comparison, is about as high a standard of medicinal value as could well be adduced, for, before we had chloral, the physician possessed no real hypnotic agent whatever. 3. With increased observation of its action came increased assurance of the credibility of the statements which accompanied the introduction of sulphonal,—viz., that when applied with fair intelligence the remedy is wholly safe. 4. With increased use, also, came increased confidence in adaptedness to purposes for which the drug was applied and satisfaction with its results. And, finally, corresponding to a gradually increasing demand for hypnotic interposition and relief which my clientele, for some time past, had seemed to present, had been a growing limitation in choice of hypnotic agents, and disappointment or vexation in their effects. In just such state of perplexity sulphonal came to hand.

As respects chloral, both physiological and therapeutic action had been generally good, but various disabilities attend its employment. An effective measure of dosage implies large bulk, demands free dilution, and insures a solution too often offensive to taste, especially with the young, and with the fastidious female. Its supposed tendency to depress the heart raises an unpleasant question in case of the adult and senescent subject. But worst of all, a popular prejudice, largely created and fostered by the secular press,† which knows nothing of that on which it presumes to pronounce judgment, has introduced a very serious obstacle to the use of chloral. In a medical experience of fully twenty-five years, I am prompt to say I have never known another drug-prejudice both so unreasonable and disastrous in consequences, and one so widely distributed, so strongly entrenched among the intelligent of the country, as that which has controlled for many years past in respect of chloral. I repeat, disastrous in consequences. Your patient has the utmost confidence in you, and has long been wont to obey your orders, but if you

* *Sulphonal* and not sulfonal. The latter is apothecaries' spelling, and foreign apothecaries' at that. It does not follow that we should accept a foreign method in orthography because we receive the material of corresponding name from a foreign source. We receive sulphonal from the chemist also; but not the name he gives it,—*diethylsulphon dimethyl-methane.* All our language analogies support the name which we assert.

† No better support could be presented of the two-fold statement concerning source of prejudice, and also ignorance as to matter discussed, than the following: A few years since, a periodical devoted to the instruction and entertainment of the young,—we withhold the name,—which is probably more widely circulated throughout the whole country than any other publication which is not strictly a newspaper, the tone of which is usually elevated, conservative, and cautious, printed in its columns a violent diatribe against chloral, which the writer denominated, in equal disregard of truth and decency, "*liquid hell!*" The writer had, apparently, taken the remedy in solution, whence his deduction respecting its "liquid" constitution.

order chloral he is pretty sure to know it (there is no plurality or choice of names in this instance, and *doctors' Latin* does not avail), and such discovery is little calculated, as repeated experience has shown, to assist the calmative and soporific influence of the sleeping potion exhibited. The remark of one patient will illustrate a common experience: "You were all right, doctor; it was the chloral that was wrong, or rather my knowledge that you gave me chloral. It made me sleepy, but I fought against it half the night *for fear if I once got asleep I should never wake up!*"

And, until sulphonal came, what other hypnotic had we but chloral? We used, twenty years ago, to call *opium* soporific, but it is quite as likely (indeed, it is more likely) to exert an excitant influence upon the brain and keep the patient awake but happy, while it puts him in worse trim than before for the work of the next day.* The *inorganic bromide*, of whatever base, is a feeble and rarely acting hypnotic, not an agent for general use and trust in this realm. *Urethan* might, practically, be defined as a feeble and nearly tasteless chloral, and of occasional activity in the infant subject. *Paraldehyde* has greater bulk in dose, greater offensiveness in taste, than chloral, while its therapeutic power is less pronounced and for less time maintained. So far as we may trust the often-repeated assertion that it does not depress the heart, it has one valid claim to our suffrages. But the patient who takes his chloral without complaint will too often "draw the line" at paraldehyde. To its offensive taste must be added the after-taste and the *after-breath* on the following morning, and which, in character and source, are allied to phenomena presented by the subject of too generous alcoholic potations. Finally, the dangers which attend an attempt to make the various *alcoholics* serve the *rôle* of soporific are too obvious for specification; while, none the less, from a therapeutic point of view, an alcoholic more justly belongs to the class of soporifics than does opium.

Therefore prompt welcome was given to sulphonal as to an agent which promised to afford relief in an exigency of much stress, many issues, and attended with much perplexity; and which, on further acquaintance, gave assurance that the welcome extended was not misapplied and still promised more and more. Thus far the percentage of failure in my application of the new drug has been very small,—exact figures are not at hand. In such small per cent., I later came to see, at times, that the fault was my own,—*i.e.*, there was faulty administration,—or, again, in a few instances, failure resulted from individual idiosyncrasy. If my success has been more frequent, my failure less frequent than that of many others who have published clinical reports; if my conclusions respecting the value of sulphonal should appear optimistic, as tried by the consensus of opinions expressed in various medical journals for the last eight to ten months, permit a suspension of judgment until I may present with emphasis what I hold to be *essential conditions of success* in the exhibition of this new and unfamiliar drug.

Such conditions may be rated as three in number. The first governs *the time* when the remedy should be administered; the second concerns *the method* of administration; the third determines *the dose.*

1. *The Time.*—It is a fact, perhaps wholly unprecedented in what we observe of other neurotic materials, that sulphonal demands from one to two hours, or, rather, better, it demands from two hours to one hour, for its physiological incubation; often quite two hours elapse between ingestion and the first accession of sensible medicinal energy. With the untried subject it is wise to stipulate for two hours. Again, as a minor consideration, although the drug does not disturb, and is not disturbed by, the processes of gastric digestion, it is well, on general principles, not to introduce it into the stomach when this organ is in a state of repletion and at the very height of functional activity. Both these points can easily be provided for. The patient who retires exceptionally early can place one hour at least between the close of his evening meal and the ingestion of his hypnotic, while nearly or quite two hours will remain before he goes to bed. But it is the latter point on which we insist,—the favorable influence of the remedy may wholly rest upon the condition,—that the patient does not get into bed, with expectation of sleep, until the sulphonal has begun to declare its action. Again and again, in my own early experience, it was made evident that the person who thus erred, through misdirection or inattention, would have been much better off if he had had no sulphonal whatever. This critical fact has not been properly set before

* Moreover, aside from such physiological impression, a vicious therapeutic influence often attends its application in insomnia. *Vide* note at conclusion of this paper.

the profession. Many who have published clinical reports upon the new hypnotic seem hardly to have apprehended it. It deserves the brief space devoted to its discussion.

The drug is confessedly directed for relief of insomnia. The patient, uninformed, looks for prompt action. Waiting for this, with no sign of its approach, he soon gets weary, then grows excited, perhaps sceptical. Much, presumably, was promised, but sleep still eludes him. One-quarter hour after another passes, and still no calm, no indication of sleep. In how many instances during the last winter might not such record, in effect, be applied to him who took his sulphonal as one should take chloral, either after getting into bed or immediately before! The brain rendered excitable through past experience with insomnia, the subject made incredulous, quite likely,—and this is a common complication,—through past failure of other resources, finds fresh provocation in this new miscarriage, and disappointment and vexation aggravate excitement, so that by the time the firm but gentle sulphonal influence is—or should have been—developed, the patient is in no condition to recognize or yield to it. Sleep comes at last, for the sulphonal will demand its own, but quite probably not until after midnight. The impression, once declared, gains new momentum every hour. Its acme is reached in the morning hours, when approaches the time for arising. The drug was taken for sleeplessness, not for sickness. Business engagements press, sleep is shaken off, from which it is positive pain to be aroused, the victim continues dazed, lethargic, sleepy, through half the day, and sums up his experience with the conclusion that the new soporific is the most "pestilent" drug he had ever encountered. And yet, with the rare exceptions to be presented later, the kindly hypnotic was in nowise at fault; the doctor was responsible both for failure and for subsequent suffering.*

It is true that now and then the soporific impulse is realized much sooner than was calculated. A lawyer, under observation, has assured me that repeatedly a 10-grain powder brought drowsiness in fifteen to twenty minutes; this is the briefest period ever reported to me. Such exceptional subjects can be instructed in terms proper to their idiosyncrasy. Yet if this peculiarity be not at once noted, little discomfort results, for the sulphonal soporific influence grows in power as the hours advance, and its early impression has little of the overwhelming force which characterizes the first assault of either opium or chloral.

The second condition is relatively of light weight. Viewed out of present connection it has high importance. Experience establishes the position that sulphonal is best dispensed in *finely-divided powder*,—*i.e.*, the crystals, as sold in the shops, should be rubbed up in the mortar before the prescription is passed to the patient. The recipe should always call for *pulverized* sulphonal. More than once has a patient been choked by the sharp-edged, semi-amorphous, semi-crystalline plates which the chemist sends forth from his laboratory, and even vomiting has followed from a strictly mechanical irritation. But, of all pharmaceutical modifications, the lozenge or tablet, whether of fifteen, ten, or five grains weight, should be avoided. Practically tasteless though it be, such mass requires considerable grinding between the teeth; the harsh, gritty feel is unpleasant; it is quickly swallowed after division into a few fragments; and sulphonal thus presented to the stomach is not likely to obtain ready and complete entrance into the circulation. How it ever enters the circulation under most favorable conditions is problematical, being, as it is, soluble by only one per cent. in water, having the power to resist both alkalies and concentrated acids; but that sulphonal in solid mass exerts uncertain and diminished energy cannot be open to doubt. More than once I have known a tablet of fifteen grains show less power than five to seven grains in fine powder. Sulphonal is far too costly to warrant such waste as this.

How shall sulphonal powder be administered to the patient? The latter is greatly liable to go wrong in this matter unless instructed, and the physician is far too liable to withhold information. The cachet or wafer serves well for a dose somewhat below ten grains; the usual dose (10 to 20 grains) is best taken from the bowl of a spoon into the mouth, or allowed to roll upon the tongue from a scroll of sized paper; a free draught of water to be taken at once thereafter. If the spoon be dipped in water before it re-

* *Sulphonal demands its own.* A strange quality, which seems to be inherent in this material. In its wise application and its usual action, the dose, which was calculated to provide eight hours' sleep, will be completely slept off in such period. If sleep be abbreviated or interrupted, the patient, who otherwise would have arisen bright and elastic, as after the renewal wrought by natural, unaided sleep, will show more or less of the state just described.

ceives the sulphonal, the latter will be more readily transferred to the mouth. To order or permit suspension in water is to occasion uncertainty as to what part the patient really received, and how much was left clinging to the sides of cup or glass. A glass that has been rinsed several times, with view to insure ingestion of the whole dose directed, may yet show somewhat of the powder clinging to its internal surface. This was first brought to my notice by a personal attempt to suspend a powder in a wineglass of hot milk, with purpose to obtain more prompt soporific impression. So much difficulty attended the scheme, such liability to loss and waste, that the nurses are very few to whom I would trust the giving of sulphonal by this method. Finally, in the rare cases, when we wish to avoid stomach ingestion, there is reason to believe, from various observations lately published, that sulphonal is equally effective, both as to size of dose and time of action, when introduced *per rectum*.

But the third specification—*determination of dosage*—is the prime condition on which rests the successful use of sulphonal; and, for the present, we are concerned only with application of the remedy for relief of insomnia in the adult period of life. First of all, and beyond question, the measures of dosage which accompanied the introduction of this hypnotic, chiefly endorsed by foreign authority, were much too large.* This did not imply danger in the least,—*i.e.*, the dose ranging from 2 to 4 grammes; and it is not impossible that those who enjoyed the rich monopoly, accruing from the sale and successful introduction of the new drug, thought still to increase their gains by directing a dosage doubly and trebly above what we have since learned to be best applicable. It was not long before we came to know that sulphonal posology should be expressed in grains and not in grammes. Often ten grains is shown to be all-sufficient; quite as often fifteen grains proves to be too much in action. Again, continuous use emphasizes an analogy with what was long since demonstrated in our experience with chloral,—*i.e.*, the patient who takes sulphonal, night after night, may, quite likely, require his largest doses at first. He begins, *e.g.*, with 15 grains, and, after several repetitions, finds 12 grains, or even 10 grains, all that is needed to give sleep through the night; later, if he still continue in his use of the hypnotic, 7, or even 5, grains is found to work quite as well. In a few instances, indeed, I have known a patient, for several successive weeks, sleep nightly upon 8 to 10 grains, with no indication, during the entire period, for increment of dose or of diminution of hypnotic energy. My own early employment of *grammes*, as now recalled, has its frequent element of the ludicrous; although, nine or ten months ago, it had its corresponding feature of annoyance for the patient and perplexity for myself. A woman, in particular, thus victimized, a sufferer from a 3-gram. dose, does not intend that the doctor should ever forget her case; she was "demented twenty-four hours after, and stupid and somnolent for a full week!"

Chiefly to such misapplication, such abuse, of the new remedy, associated with non-recognition of the fault by the prescriber or misapprehension concerning the cause of certain sequential phenomena, is to be traced the source of much of the unfavorable conclusions or adverse criticisms which have appeared in the journals respecting the influence and the value of sulphonal. It may well be that the patient who takes 40 grains hardly sleeps more soundly through the night—at least the earlier part of the night—than he who takes but 10 grains; but the experience of the former is not at an end when has come the hour for rising; his punishment is sure to follow. Quite surely his sleep has gained new momentum with every hour after midnight; and, at times, no ordinary means, at the usual hour for getting up, will serve to awaken him and put him in condition to leave his bed. To such a subject might apply in full force the words addressed by the wise man to the sluggard. And worse yet is the state which sets in when forceful measures have for the moment antagonized this stupor; in this is chiefly evident the sulphonal punishment, and this chiefly presents the penalty of overdosage. The somnolency, the yearning for resumed sleep, the inaptitude for all exertion, mental or otherwise, are so emphatic,

* It is a coincidence worthy of remark that a similar observation applies to the introduction of chloral hydrate. My first practical acquaintance with this drug was as advised by Professor Edw. H. Clarke, long the able incumbent of the Chair of Materia Medica, Harvard University, and who directed for the patient, seen in consultation, 30-grain doses, repeated under such conditions and at such intervals that he had received ninety grains at the end of three to four hours; this in circumstances which, but two or three years later, would not have indicated an aggregate dose so large by one-half. The posology of my lectures, also, early in the seventies, represented the established practice of the profession at that period, and provided for 20 to 40 grains as the average adult dose.

so imperious, so raised beyond and above all means of control or mitigation as, repeatedly to the sufferer, to suggest an idea of physical pain; and such intolerable experience may well hold, with no sign of let up, for fully half the day.* Judging from my own practice and the mishaps in the practice of many others, in the earlier period before exaggerated dosage was abandoned, I have often wondered that reaction did not set in, from the cause just indicated, of stress sufficient to emperil the general and further acceptance of the new and valuable soporific on the part of the profession. I know of no sequential influence, from a slightly toxic impression, exerted by any other narcotic or neurotic agent, which has features in common with what are prominently characteristic of such misuse of sulphonal; so pronounced, so distressing, and yet so free from all danger.

But this concerns what is confessedly unequivocally toxic action, or approach to it. The value and use of the new hypnotic should not be affected, in the slightest particular, by considerations based upon what the drug may do when it is grossly misapplied. Where the exhibition of the remedy has been intelligent and the dose rightly proportioned, the patient may be expected to awaken, after a sleep normal both in quality and duration, with much of the vigor and elasticity which, in the healthy subject, marks the renewal wrought by natural sleep. In its right administration and in its best—I may even add, in its *average*—operation, thus conditioned, the man who owes his sleep to sulphonal, in such sleep absolutely sleeps off all drug impression, and the nervous system will no more present sequential trace of this influence than will the alimentary canal.

Thus far the predominant experience has been had in view, allusion has been made to usual, to average results. Sulphonal at times disappoints,—what effective drug does not?—and, in the occasional subject, after repeated trial and renewed effort at adaptation, either proves of little value or declares a pernicious influence. All active remedies, and especially neurotic remedies, are liable to change or perversion of operation through the impression brought to bear by the universally recognized physiological modifiers,—age, idiosyncrasy, etc.

First, as to *age*, and briefly, because the report must be largely negative. As before said, it has been chiefly in the adult period of life that sulphonal has been directed; and such limitation of experience has been general throughout the profession during the past year, judging by the reports and monographs thus far published. Indeed, no positive fact could well equal this negative indication, for the proof it affords that we have at last in our hands *a purely and strictly hypnotic material*, such material being calculated to meet the demand presented by insomnia, and insomnia being a condition of adult life.

As to infancy, I should hardly know how to tabulate dosage to meet the modification herein presented. *A priori*, sulphonal offers the advantages, which no infantile soporific ever offered before, of tastelessness and innocuousness; and, recently, I have more than once prescribed the powder to the subject of 4 months and upward in dose of 2 grains and upward, with permission to repeat *pro re nata*. But, unfortunately, the infant, that does not and cannot sleep, is too often kept awake by gastro-intestinal trouble,—*i.e.*, by some derangement of stomach digestion or by faulty secretion, and resulting pain and spasm, in the intestine, below the stomach. The action of sulphonal upon the entire alimentary canal is absolutely *nil;* surely, it has not virtue in the *rôle* of eupeptic, anodyne, or antispasmodic. The disturbed or absent sleep of infancy must more often find its remedy in pepsin or in some opiaceous preparation rather than in sulphonal.

Nor are we prepared to state how far the condition of *senility* may either justify or modify exhibition of sulphonal. The bromides often fail of their purpose, as given to the aged subject, and there are physiological grounds for their failure. Chloral, otherwise safe, may suggest danger, as thus applied. Sulphonal, in corresponding use, may or may not have less energy, but that it is less safe in the senile than in the adult patient we cannot for a moment believe.

Of the second source of disturbance—*idiosyncrasy*—we have more to say; and, still, what remarks here apply must be put in few words. Whenever sulphonal is found to be unadapted and inadaptable to an individual, whose condition indicated its use, and there-

* *Physical pain.* More than one such sufferer has of himself suggested such analogy. "Why, I would suffer real pain rather than go through with it again!" This has been said more than once. One individual quaintly compared a recent experience with what he had remembered through life and could never forget,—the agony often inflicted in early boyhood, when he had been made to sit erect and keep awake during a long sermon in church.

fore some other hypnotic must be substituted, the idiosyncrasic disability may be referred to either one of two types. First, the patient does not and cannot yield to its ordinary physiological influence,—he sleeps little better than he does without the drug; or, again (second type), whatever experience he may have had through the night, as respects sleep, and however moderate the dose, he suffers for a considerable part of the next day with somnolency, heaviness, and perhaps dizziness; in a word, toxic action follows medicinal dosage. I have observed so small a quantity as 5 to 8 grains produce this effect in a few individuals. If the subject who presents the first type be pressed with larger dose,* it is not at all certain that his sleep will be improved either in quality or duration, but he is almost sure to suffer from the phenomena just noted, hours after all trace of physiological impression should have disappeared. Fortunately, this twofold constitutional perversity, *quoad* sulphonal, is not often encountered in either form; but of its existence I have had unmistakable evidence more than once. When it does obtrude, as in all else respecting idiosyncrasy, in the impression of whatever drug, the patient *a priori* seemed to be as favorable a subject for a trial of the new hypnotic as had the ten or more preceding persons who had taken sulphonal and shown only its best effects.

Mental states, cerebral conditions, both as respects brain function itself and modified blood circulation through the brain, are recognized as exerting various influence upon the physiological action of chloral and the bromides. How such conditions may modify the operation of sulphonal (whether, *e.g.*, *cet. par.*, its action is more readily procured, more kindly, is longer maintained in the anæmic than in the hyperæmic brain, or *vice versa*), we have no data on which to advance an opinion. But one fact, if it be a fact, as we are well assured it is, having close relation to this department of the subject, is of value and significance.

It was surely an astute observer who, among the earliest writers on the new drug, placed it on record that sulphonal is particularly applicable to the insomnia which originates in, is characterized or aggravated by, "worrying and anxious thoughts." This has proved emphatically true in repeated cases of my own. Such mental state will often convert opium into an excitant with the patient who, in calm mental status, has previously been shown to be susceptible of calmative action on the part of this agent, and even occasion like miscarriage in the operation of chloral. But the man who carries "his business to bed with him," in a season when business is bad, margins small, or when wreck is feared, the insomnia which has its source in the grief of bereavement, at times, would even seem to invite the sleep-compelling power of sulphonal. As thus far observed, one of the most gratifying, one of the most beneficent, offices of the new soporific corresponds to this peculiarity of action.

Finally, shall we refer to the class of physiological modifiers, shall we ascribe, preferably, to idiosyncrasy the rarely observed phenomena, lately noticed in the journals, where perplexing or alarming sequelæ appear to have been developed after the ingestion of a moderate dose? Shall we refer the cyanosis of one clinical reporter, developed the following day in a patient who slept upon 30 grains, to this remedy and such dosage? or the eruption of another record, following moderate exhibition, which covered the entire cutaneous surface, and resembled measles? I myself certainly have had no experience at all answering to such observations, and I am incredulous as to their correctness, as involving any responsibility of sulphonal. Not many years after the introduction of chloral, Liebreich wrote a memorable paper, in which he attributed a very large per cent. of the mishaps, which had attended its use hitherto, to grossly impure specimens of the drug, which had been made to flood the market, adding, that the American drug market had sinned and suffered above all others in this respect. If the close monopoly, which has thus far controlled the sale of sulphonal, and maintained its cost above all considerations of justice and reason, shall protect us against the adulteration which, in the early history of chloral, beyond question, distributed danger and death far and wide, and wrought early prejudice against an invaluable drug, perhaps we can well afford to pay so high a tax; but there are already indications that the physician cannot always depend upon the purity of the sulphonal prescribed to his patient. In a word, all doctors are not good observers, all druggists do not dispense pure drugs. Responsibility for the faults of recent allusion

* It is right to repeat,—the assertion cannot be too strongly emphasized, it concerns a law governing the physiological action of this new remedy,—*the usual subject of insomnia who does not sleep upon a dose of* 10 *to* 20 *grains,* 10 *to* 15 *grains, is not amenable to its influence in any measure of dosage.*

must, pretty surely, be placed elsewhere than upon a correct and skilled exhibition, and corresponding operation, of our newly-acquired hypnotic!

Once more, and briefly. How certain morbid modifiers may influence the action of sulphonal, as otherwise observed, is a question of great practical interest; but, unfortunately, such answer as can at present be given must be largely negative. How does pyrexia, heated blood, the throbbing arterial vessels which carry such blood to the brain, affect sulphonal in its function of procuring sleep? We are not prepared to say; but the clinical note which follows has significance and all the value which can accrue from a single observation.

Is sulphonal safe, or is its action cumulative, and so toxic, after a few repetitions of dose, in renal disease, where kidney function is much impaired or practically suspended? Upon this problem our brief record bears. Again, a large majority of medical materials are eliminated by the kidneys, chiefly or altogether. Do we yet know through what organ, by what avenue, sulphonal leaves the system?

A man of age past 50, dying with the slow, torturing death which attends progressive pulmonary œdema, in the last stage of waxy kidneys, and apparently dying from such condition alone; deprived even of the doubtful comfort derived from that animal opiate which kidneys that have nearly lost their function sometimes permit to accumulate in the blood; cyanotic, orthopnœic, with hippocratic face; unable to sleep, nor daring to sleep if he might. Here sulphonal, given in 8- to 10-grain doses, at two to three hours' intervals, proved a boon indeed, and was not long in setting up a state which steadily developed into a veritable euthanasia. A degree of soothing and calmative influence was apparent after the second dose, and frequent but brief periods of sleep soon followed, which had been absolutely absent for forty-eight hours before. In a word, the new drug seemed to be the only drug which could have been availed of. Both opium and chloral were clearly contraindicated, and the bromides would have been little else than an aggravation.

In conclusion, gentlemen, I believe sulphonal to be *the hypnotic* in eight or nine out of ten cases requiring hypnotic resources, as presented to the physician. And here I speak, as I have spoken from the first, from the stand point of the general practitioner. Perhaps it has not the energy of chloral in cases offering violent resistance, as, notably, in the maniacal subject, although even here it may be presumed that repeated dosage and accumulated influence may sometimes control where chloral, within limits of safe exhibition, has proved inadequate. But this apart, the application of our new remedy is practically confined to such as will yield to its power in quantity varying from 10 to 20 grains. A large majority of subjects of insomnia, as before said, will find in this measure the relief that is sought.

Already has sulphonal, as remarked in the early part of our paper, established its claims of first rank in the class of materials prescribed for procurement of sleep; and yet only one year ago its name had hardly been heard among the profession. But, on the other hand, it must be confessed that it is the infrequent practitioner, even at present date, who has formed such acquaintance with the new drug as to be able to give an independent opinion upon its merits; while, correspondingly, innumerable patients have been denied the aid and comfort only to be derived from this source. Two adverse conditions have served to delay its prompt and general acceptance by the profession,—first, its exaggerated and reprehensible cost; and, second, a not unnatural hesitancy with physicians to accept a new remedy because of past promises, in repeated instances respecting other materials, which were never kept. But, however often he may have been disappointed or deceived in the past, the progressive physician can no longer safely hold a sceptical attitude towards the development of therapeutic resources, in consideration of the fact that the period is much briefer than a decade which has produced antipyrin, acetanilide, sulphonal, and many other additions to our pharmacopœia of like value; while we are surely in position to insist that the materia medica teaching of twenty years ago, and which then had the mark of immemorial antiquity, has lately received, in an important particular, modification and extension, our remedial agencies no longer being drawn from "three kingdoms of nature" but from four,—viz., the mineral, vegetable, animal, and *chemical* kingdoms.

SUPPLEMENTARY NOTE.—The disparaging remark made respecting the hypnotic virtue of opium seems to demand slight qualification, and also suggests one or more practical observations of close relation. We have long

been used to teach and receive that opium has two general uses,—innumerable as its special uses may be,—corresponding to its application for relief of pain and for procurement of sleep. But the fact seems to be that while this material, wisely directed as anodyne, is more constant in its beneficent action than is that of almost any other drug, for whatever purpose employed, negation, vexation, aggravation commonly attend its service as hypnotic. None the less, there are rare cases, but unmistakable and otherwise uncontrollable as they are rare, in which opium proves to be the only effective soporific which the physician has at hand; whether it be used alone or as the agent of power in combination. In this connection is recalled a case seen during lecture term last year, and which is illustrative, although it was not observed with purpose of study. A rather stalwart medical student, down with typhoid fever, and sleepless night after night. Chloral alone, and in combination with sodic bromide, in repeated and raised doses, seemed hardly to touch the patient; but a moderate dose of Dover's powder brought sleep on first trial.

But the case which follows, and which shall be cited in terms as brief as possible, drawn from my clinical experience of the past month, seems to claim the space given to it as illuminating not alone the question at issue but other phenomena of hypnotic medication. A man, æt. 50, of weight above two hundred pounds, and of size and muscular development such as to render his weight only normal. Long engaged in arduous and prosperous business; of habits so strict that he did not even smoke. No weak point in heredity, no organic disease or disorder. Had long suffered from insomnia; could not remember for many months past when he had had eight hours sleep of a night. Had previously consulted various physicians, and had evidently made rapid transit from one adviser to another; had taken counsel of the homœopath, who measured out for him sulphonal in 30-grain doses; and had resorted to regular physicians, who had not given him the advantage of a trial of chloral. The latter fact was made evident soon after the case came into my hands.

The first night I ordered two powders of pulverized sulphonal, of 15 grains each, with one and a half hours' interval between doses; these to be followed later by 20 grains of chloral, if chloral should be required. Report next morning: took all that was prescribed, slept eight hours, "am half well already!" Here I made the mental note that sulphonal is quite likely not to be trusted to in conditions presenting great resistance and demanding positive therapeutic energy of action; for evidently it was the chloral that gave sleep. The second night prescribed freely of chloral alone, and failed miserably of my purpose. The third night resolved to mass doses,—still using chloral alone,—making them larger and fewer in number. The nurse was instructed to give 50 grains (!) chloral at bedtime; if patient awakened at any time short of eight hours, to give 30 grains more, and later, under same condition, 20 grains. Left the patient with slight misgiving; but the case was one calling for heroic medication, and "there are times when the physician must assume to be the 'master of nature.'" Report next morning: patient had taken his hundred grains of chloral in the space of about four hours, and had had about five hours of broken sleep. Here I made a second mental note, in effect that certain cases presenting *great resistance, and demanding strong therapeutic energy*, may show chloral to be about as ineffective as sulphonal.

The next night a preliminary 30-grain powder of sulphonal was given, and 2 hours later, as the patient got into bed, was administered *per rectum* a suppository containing half a grain of morphine and one-third of a grain of extract of belladonna; and at this point, and by such method, the problem was solved. Here was made a third mental note, of character to suggest and justify the present supplementary discussion,—to wit, that, in rarely encountered cases, our most valued hypnotics, and those of daily trust, altogether fail us, and opium alone proves the agent of power in procuring sleep.

None the less, there is already somewhat of evidence for belief that a preliminary exhibition of sulphonal—as after the analogy of such use and service of a bromide, but more emphatically—is efficacious in rendering opium soporific, which, otherwise, might have proved excitant and agryptic.

A final observation in respect of recourse to opium as a hypnotic; and I desire to present it with especial emphasis, for it concerns a practical point which has been too seldom taught and which is too unfamiliar with the profession. Its uncertainty of action is not its only fault, is not its gravest misdemeanor, —*i.e.*, as respects the exertion of a soporific or of an excitant influence. The drug is dangerous from a therapeutic, as it is often disappointing from a physiological, stand-

point. The insomnia which finds its relief in opium rapidly demands increase of dosage; and when an attempt is made to shake off such dependence, though the period of resort to opiates may have been the briefest, there almost surely returns in exaggerated form the original disability; the insomnia is more unruly and exasperating than before the opium was used. It is thus from a special and an additional condition that the man who gets his sleep through this drug is in peril above him who employs it for relief of pain.

Contrast such record with that of the successful application of chloral and sulphonal. In extreme conditions, I have known a patient to depend upon the former for months together (even for six months), and the latter for several successive weeks, for his nightly sleep; and, aside from need of increased dosage, quite often the original quantity was progressively diminished.* And thus far, not only, but when the right time has come, when is declared the condition which gives evidence that brain and nerve have been sufficiently restored through normal sleep, secured without intermission night after night, the nightly sleeping potion has been dropped all at once, and the patient seemed hardly—or was not at all—conscious of its loss. This is equivalent to saying—and it is not too much to say—that a true hypnotic, skilfully applied to a typical case of insomnia, is *curative*. It used to be held, in the earlier experience with chloral, that this agent could only serve as a temporary and palliative measure, could only afford relief for the time, until the condition which caused the insomnia should be otherwise, by other agencies, removed. But we have long since come to know that whatever the means, artificial though it be, which provides physiological sleep, and which, by repeated use, substitutes a habit of nightly sleep for the habit of nightly sleeplessness, the same thereby and through such operation of itself cures insomnia.

In conclusion, we cannot withhold the remark that our small class of soporific remedies, lately so strongly recruited by the addition of that which has formed the subject of our paper, has too often suffered, been misapprehended, been harshly judged, not alone by the secular press and the public, but by representatives of the profession. Their misapplication, by way of indulgence, and with result of more or less constant intoxication, is an evil of wide extent, and fraught with fearful consequences beyond question. But the prominent notice taken of the occasional chloral habitué, in whose behalf is sought the protection of an asylum, or who ends his life by suicide, the public fulminations against the doctor who will use so deadly a drug, and the accompanying plaudits of the homœopathic doctor and his little pills, are urged by no kindly spirit and serve no good purpose. Let us look at the other side of the shield. How is it with the hundreds, nay, the thousands, throughout the land, who are every year saved by the timely and judicious use of hypnotics! Our captious critics disregard this aspect of the question; and who, thirty years ago, would have brought up in the insane asylum for the want of the bromides, chloral, sulphonal, in the practice of a school of physicians which possessed no specifics for the relief and cure of insomnia, for the procurement of healthy sleep.

* As before said, and as concerns the temporary use of sulphonal, we often first order 15 grains for a night or two, then drop down to 10 grains; and if the soporific is still to be continued, 7 to 8 grains proves all-sufficient. What physician of experience would dare to apply a corresponding method in his use of opium for soporific action!

THE DIARRHŒAS OF NURSLINGS AND THEIR THERAPEUSIS.

By G. Archie Stockwell, M.D., F.Z.S., Detroit, Michigan.

(Concluded from page 521.)

TREATMENT.—Admitting a cause which the diarrhœa seeks to mitigate, by what rule of thumb or therapeutical philosophy is the malady to be remedied by efforts that tend to repress the flux to the retention (and absorption) within the economy of the very effete, noxious (and perhaps toxic) factors that are the source of the disturbance, and in the removal of which Nature is engaged?

By what measurement of common sense may the exhibition of an antiseptic, as such merely, be expected to combat a malady dependent upon malnutrition and non-assimilation, since antisepsis is merely the antithetic foe of fermentation and putrefaction, and deals with a product instead of a definite cause? It may mitigate as regards virulence; it may tide over until Nature can recuperate sufficiently to perform her own work; but it can by no stretch of the imagination be considered to remove the cause.

To secure a condition inimical to the diarrhœa, is demanded perfectly healthy digestion and absorption. To retain this condition, or to prevent the accession of diarrhœa, food precisely suited to the powers of the digestive organs must be supplied, and regularly, and moderation insisted upon.

In diarrhœa, as already mentioned, we are concerned first of all with perverted digestion, and irregular gastric, pancreatic, and biliary action,—the two last being mutually dependent upon each other,—and the absorption of ptomaïnes or kindred poisons which Nature is vainly attempting to exclude from the economy. The indications, then, are: *First*, to remove the poison and source of irritation; *second*, to restore to the secretions their normal constituents, thereby insuring proper digestion; *third*, to combat such inflammation as may have arisen from poisoning and non-assimilation; *fourth*, to restore to the economy at large, and as speedily as possible, that of which it has been deprived; *fifth*, when the discharges are so profuse as to threaten collapse or otherwise endanger the life of the creature, to check the same by the method that will most surely suppress the waste of serum, and least tend to absorption of toxics,—ptomaïnes. These last two propositions are in a great measure dependent upon the second, and indirectly also the third.

To attempt to arrest the flux simply by means of astringents, singly or combined with opiates and antacids, is, as a rule, pernicious, since it tends to aid the very processes that it is desirable to suppress,—viz., the absorption of ptomaïnes. There are cases, however, of extreme emergency, where suppression of the diarrhœa is imperative, but even these are not, as a rule, benefited by astringents purely. Opiates relieve suffering, but also, when administered without due consideration of physiological action, lock up the secretions, normal and abnormal alike; the ill effects of such therapeusis may be seen in calves, when the farmer's wife essays to check the scouring, and, if successful, locks up an indigestible mass in the intestines, to the induction of an enteritis, or provoking a gastric catarrh that later proves fatal. Fatality is, of course, laid to the exhaustion produced by the diarrhœa, instead, as should be, at the door at the astringent. Opiates, moreover, are most uncertain in the infant economy, and it is impossible to so regulate the administration as to hold unencroached the border line between sedative action purely, and narcosis; further, they are very apt to prove cumulative in action in nurslings. Mention has already been made of the introduction of antiseptics in summer complaints, and that such introduction is tacit admission of the inutility of remedies heretofore deemed "classical."

What, then, are the therapeutic measures most available?

First, mercurial or other alteratives of like action; *second*, pepsin, pancreatin, bismuth, cerium, antipyrin, chloral, wild yam, leptandrin and drugs of its class, hydrastin, salicylic acid, lactic acid, carbolic acid, mineral acids, quinine; *third*, tonics; *fourth*, strict attention to diet.

A full dose of mercurial or other cathartic (not less than 2 to 5 grains of calomel for a child under 1 year of age, with rhubarb and camphor mono-bromide to prevent griping) clears the intestines of irritating matters, changes the character of the secretions towards normal, and by stimulation of mucous follicles clears their orifices and substitutes mucous for serous exudation. This alone, after the cathartic effect has passed off, will show great diminution in the diarrhœa, and less serosity. Next should follow remedies to re-establish normal secretion and digestion, to relieve inflammation, and check excessive peristalsis, and to further the neutralization and expulsion of any remaining poison. First, now, pepsin and pancreatin (and perhaps acids) come in play. Second, the antacids, of which the best are cerium oxalate and bismuth subcarbonate. After calomel, for a few hours, perhaps mineral acids are best avoided, and the lactic acid substituted, though salivation is all but impossible in any nursling infant; but leptandrin, ipecac in minute doses with sugar of milk, irisin, euonymin, baptistin, and especially hydrastin, with quinine, continue the good action of the mercurial, and tend to check the flux, especially if combined with cerium and camphor bromide. In the mean time, pepsin and pancreatin are advantageously prescribed in connection with feeding, as hereinafter mentioned, though the former may be added to the alteratives by omitting the cerium or bismuth; for reasons obvious, also, these are often best administered suspended in some mucilaginous vehicle, as tragacanth or acacia. Regarding antiseptics, it may be remarked, such are not demanded as direct remedial agents, though they oftentimes prove valuable adjuvants, especially chloral and antipyrin. Complete digestive activity presupposes perfect antisepsis; experiment outside

the body has demonstrated that in the normal condition the digestive secretions, whether from the salivary glands, from the stomach, or from the liver, show a remarkable power of resistance to putrefaction. Although the entire quantity of the digestive fluids seems large, it must be remembered that they are absorbed almost as soon as they are poured out, so that there is no excess of fluid in the tract during digestion. In the gastric secretion, the hydrochloric acid is held to be the main cause of this antiseptic action, although when pepsin is secreted in proper quantity and of normal activity, it also contributes to this effect by the promptness of its action; and, moreover, the quantity of the gastric juice and the rapidity of its reabsorption, under normal circumstances, would be highly unfavorable to the occurrence of septic changes. Another fact may be assumed to have some weight in this matter. These fluids that are separated from the blood in such quantity are returned to it so rapidly that for practical purposes they may be considered as still constituting a part of the circulating fluid; in other words, living fluids have a certain power of resistance to septic change, and when in normal condition, the blood has this quality, and the digestive fluids are a part of the circulating fluid, only temporarily separated from it.

When diarrhœa is exhaustively depleting and of serous character, so much so as to admit of no delay, fluid extract of coto-bark (or its alkaloid cotoine), with or without an equal quantity of fluid extract of wild yam, accordingly as there is, or is not, evidence of severe griping, will answer every purpose of an astringent, without the pernicious action of the latter. It appears to be a stimulant alterative and stomachic, increasing the appetite, lowering temperature, and at the same time antiputrescent and antizymotic: it is specific in that it modifies and restores the functional energy of the intestinal epithelium, and, temporarily at least, neutralizes the toxicity of ptomaïnes. It is insoluble in gastric juice, but readily soluble in intestinal fluids, and does not in any way modify peristalsis. When the pain is manifestly severe and colicky, wild yam, or some substance that will control peristaltic action, is indicated, and if it seems desirable to anæsthetize the intestine, chloral or antipyrin are advantageously employed. The rest thus given the bowel is often of incalculable value, not only in relieving inflammation, but in allowing Nature an opportunity to resume her sway.

After the administration of chloral or antipyrin, or after the inflammation is calmed by coto and yam, pepsin and pancreatin come in play, and also the alteratives, including quinine* and antacids. In diarrhœa lienteria, trypsin or pancreatin is imperatively demanded. As Professor Lesage truly remarks, "It is the only remedy that does any good, except a purgative, which may be given for the purpose of clearing out the fermented and undigested milk." When pepsin is employed, however, the antacids must be given separately, and with considerable interval between the two; for as pepsin acts only in an acid medium, the addition of bismuth, cerium, or other antacids is alike unchemical and unphysiological, the action of the former being prevented or neutralized. The good effects so often claimed of this combination, are due solely to the mechanical action of the antacid in spreading itself over inflamed surfaces, and thus temporarily relieving irritation.

When the diarrhœal disturbance can be traced to some fault in the economy of the parent, this should be looked after and remedied. A saline aperient administered to the mother at occasional intervals, is especially valuable when there is a tendency to diarrhœa in her infant from indigestible curding milk, or from unknown causes. Indeed, when diarrhœa appears, it is often advisable to remove the babe from the maternal breast, and hand-feed, in order to insure proper nourishment.

When the dejections of the babe are freely acid, fatty, and manifestly accompanied by tenesmus, it is more than probable the primary fault is imperfect or improper pancreatic digestion, when pancreatin is demanded (perhaps in connection with an antacid and alterative) to aid in restoring the function; *per contra*, if the fæces are abundant in curd, pepsin is required to be exhibited. Both conditions may, and do, obtain together. Again, light colored dejections denote deficiency in biliary products; but if dark and green, the reverse. But it must be remembered, as before noticed, that lack of biliary secretion is too often a concomitant of defective pancreatic secretion in nurslings; also that biliary excesses are likewise accompanied by pancreatic excesses, when the stomach is almost certain to be deficient in the material by which its contents are transformed into peptones.

* Quinine is especially valuable in that it is antiseptic and antifermentative; and it diminishes tactile sensibility and increases the volume of the red corpuscles by increased supply of oxygen.

Digestive Ferments.—In most forms of diarrhœa the sheet-anchors of treatment, so to speak,—*i.e.*, after the irritating ingesta are gotten rid of and immediate inflammation allayed,—are the digestive ferments,—pepsin and pancreatin. These are the only strictly physiological remedies of which we are possessed, and, most unfortunately, are generally overlooked, and as generally, perhaps, misunderstood as to their therapeutical application and value. Further, a fact not generally known is that both these ferments are much more definite and certain in their effects in the *primæ viæ* of nurslings than in adults, and for the reason that greater demands are made upon both, and the natural supply of ferments depend upon the exact character and quality of the food supplied.

Pepsin as a therapeutic agent has never been obtained as a distinct principle in a complete state of purity, but is contaminated in greater or less degree with substances which are themselves inert, but present insurmountable difficulties in separation. Acting in an acid medium, it exercises its digestive function upon albuminoids solely; for this reason its popular administration, in connection with an alkali, such as sodium bicarbonate, is a source of grievous error. Its employment must be decided upon from a strictly chemico-physiological stand-point, and the above facts borne in mind, for it is very far from being, as is generally and popularly assumed, a universal digestant.

The action of pepsin, too, is in a sense catalytic; and theoretically a small quantity should digest an unlimited quantity of albumen. The conditions for such action, however, do not exist within the human or animal economy, especially in the class of diseases to which the remedy is applicable; we cannot rationally expect a minute quantity of the remedy to digest food unreasonable both as to quantity and quality. The general failure of pepsin in theoretical and therapeutical applications, aside from the causes already noted, are from the exhibition of small and inefficient doses, or from employing an inferior and perhaps insoluble article. A large proportion of the pepsins in the market are known to be insoluble and inert; all vary in quality, and may, moreover, contain elements that are themselves pernicious, and of the very class and character of those it is desired to get rid of that are concomitants of the disease,—viz., ptomaïnes. Professor Victor C. Vaughn (of the University of Michigan) asserts this as a fact of most, if not all, low-grade pepsins; and when we consider the mode of manufacture and production, we can readily understand why this is so. For these reasons, I deem it fit to present the results of the analyses of the best-known products, as made by John R. Winslow (Professor of Chemistry, Woman's Medical College, Baltimore) and R. H. Chittenden, Ph.D. (of the Chemico-Physiological Laboratory of Yale University), of pepsins purchased in the open market, as a guide to intelligent administration and employment. These analyses together are substantially as follows:

1. Parke, Davis & Co.'s, 1 grain dissolves 2000 grains of albumen.
2. Fairchild's, 1 grain dissolves 1200 grains of albumen.
3. Scheffer's, 1 grain dissolves 960 grains of albumen.
4. Jensen's, 1 grain dissolves 700 grains of albumen.
5. Ford's, 1 grain dissolves 640 grains of albumen.
6. Merck's, 1 grain dissolves 320 grains of albumen.
7. Boudault's, 1 grain dissolves 280 grains of albumen.
8. Royal Chemical Company's, 1 grain dissolves 180 grains of albumen.

Thus, all other matters being equal, a double quantity of No. 2, and twelve times as much of No. 8, must be administered to secure the same result obtained by No. 1. My personal preferences, however, are for No. 1 and No. 7, both of which are sheep pepsins, and less likely to contain insoluble and ptomaïne products than any of the others. The separation of pepsin from the stomach of the sheep is attended with less difficulty than from that of the hog, and is purer, though of less proportionate quantity. The above experiments, being purely chemical, represent possibilities obtainable in the laboratory, but not, of course, uniform in the stomach. Digestive power, within the economy, as before noted, is considerably less (for reasons which cannot be entered upon in this connection), and further modified by circumstances,—disease, character of the food, amount of fluid taken, etc.

Another phase also is presented when we consider the character of these insoluble varieties. Mucus, which is a product in the preparation of the cheaper pepsins, and consequently intimately mixed therewith, rapidly undergoes decomposition on drying, such being the result of the action of ptomaïnes. Now the decomposition of mucus procures

cadaverine, one of the most poisonous of all the animal alkaloids, and the effect of administering insoluble pepsin to an infant whose entire alimentary canal is in an inflamed and abnormal condition can well be imagined.

The pancreatic secretion consists of a combination of four distinct ferments, which seem happily designed to supplement and complete the work left unfinished by the secretions of the parotid and submaxillary glands, and the stomach,—first, amylopsin, similar in action to diastase, converting the starch into dextrin and sugar; second, a curdling ferment, acting on milk in an analogous manner to rennet, or the curdling ferment of gastric juice; third, trypsin, having powerful peptonizing properties; and, fourth, steapsin, known as the fat-splitting or emulsifying ferment. The chief of these ferments, and the one of paramount importance, is trypsin.

Pancreatin, which represents all these ferments, has an extended range of activity, and, unlike pepsin, acts in an alkaline medium, and is usually advantageously prescribed in connection with soda. For like reason, also, pancreatin and pepsin may not be prescribed together, but the former should precede, and the latter follow, the taking of food.

In all diarrhœas the best results of pancreatin and pepsin are obtained when the little sufferer is removed from the parent or nurse, and hand-fed with milk that has been rapidly and artificially cooled, and duly diluted with cold water previously boiled, and peptonized. It may further seem advisable to remove a portion of the cream from the milk, substituting instead a small amount of some farinaceous product, such as roasted malt or flour. The fact has long been recognized that bland and easily-digested farinaceous substances, or even minute portions of cellulose, mixed with milk, aid in preventing casein from forming large and firm masses in the stomach by mechanically separating its particles. Again, the addition of a little table salt to diluted milk has a most happy effect, as it delays and renders difficult the firm curdling of milk by rennet (*Pflüger's Archiv*, xiii. p. 93); thus, it should be added to cow's milk, as a rule, when it is not peptonized, and to woman's milk when large curds are brought up by vomiting or appear in the diarrhœal discharge. This insures more even feeding, and better action of the digestive ferments. With the food may be administered pancreatin; after feeding pepsin, if required. Between feedings, alteratives, antacids, and antiferments may be employed, if desired, such as charcoal, naphthalin, lactic or carbolic acids, creasote, and iodine, which last three should, however, be given by themselves, and in small and oft-repeated doses; mercury deuto-iodide, answers a like purpose, but is less soothing to the irritated intestinal tract; and, when severe pain is present, salicylic acid is often advantageously substituted. Marked tenesmus, however, is better relieved by chloral-hydrate or antipyrin (perhaps in connection with wild yam), either of which anæsthetize the intestinal tract, and at the same time in no way interfere with its normal functions other than by decreasing peristalsis. Both, also, are antiseptic to greater or less degree proportionately to the doses employed, and vastly superior to any preparation of opium.

In the majority of cases, pancreatin, or pepsin (or both), as occasion demands, is all-sufficient to relieve a simple dirarhœa and restore healthy secretions. When the pancreatic fluid is wholly and normally restored, abnormal fermentation becomes impossible; and the biliary secretions are brought in accord therewith by the action of some mild alterative, as leptandrin or euonymin, or, better yet, hydrastin, combined with ipecac in minute doses, along with cerium oxalate.

Pancreatin should, as before remarked, be administered a few moments prior to feeding, or, in other words, before the secretion of acid liquid and pepsin has been provoked in the stomach by the presence of food or peptogens. The object to be thus gained is, to remove the pancreatin from the possibility of destruction, and into the duodenum where it exerts its action, and where it properly belongs.

"Peptonized" (or pancreatized) milk is unsurpassed in the prophylaxis of diarrhœa in the young, and is also a valuable adjuvant in the management of the malady. It cannot be too highly extolled where epidemic or endemic fluxes threaten in a community, since the casein contained is transformed into flakes that are readily digested, causing no suffering or gastro-intestinal irritation. It may be prepared by adding two or three teaspoonfuls of liquid pancreatin (or five grains of "pure pancreatin") to a gill of cold, boiled water, in which has previously been dissolved a scruple of sodium bicarbonate, and adding to a pint of milk warmed to 110° to 115° F. This mixture should be set in a warm place until the opaque whiteness of the milk gives way to a grayish color, or a slight bitterness is developed, when it may be removed

to the ice-box, spring-house, or otherwise rapidly and artificially cooled in order to suspend further digestive action. It should be used before many hours have elapsed, as it does not keep long; or, better yet, made fresh as required. When farinaceous additions are to be made, if roasted, they are best stirred in the milk when the latter is warm. Another equally good plan, one by which the roasting is avoided, is to make into thick gruel by boiling, subsequently thinning one-half, and adding to the peptonized milk in the proportion of 1 to 4 or 8 of the latter. "Pure pancreatin," so called, is a misnomer, since that which is sold under the name is simply a highly-concentrated preparation containing the various digestive ferments of the pancreatin secretion; such title is of empiric origin. Pancreatin should, however, be of definite, known strength, and five grains with a scruple of soda should completely peptonize a pint of milk at a temperature of from 110° to 115° F. in half an hour. If such proportion of pancreatin to milk fails to peptonize, such is *prima facie* evidence of the utter worthlessness of the ferment.

Milk containing a large proportion of casein will sometimes curdle under the influence of the pancreatin, a difficulty that may be obviated by increasing somewhat the proportion of water and of pancreatin, or reducing that of milk.

Heat is not necessarily a concomitant of the pancreatizing process. If preferred (and it is sometimes advisable), the milk may be diluted with half its volume of lime-water, pancreatin being added in the proportion above given, and the mixture allowed to stand for three or four hours at ordinary temperature, occasionally stirred. Peptonized milk, however, must not be considered as at all meeting the indications of treatment in diarrhœa, for such, far from being a remedy, is merely a food that can always be made of like quality, and administered in such quantity and frequency as the individual case demands. It is an easily assimilated and highly nutritious article of diet, which generally proves acceptable even to the most irritable stomach, and is eminently useful in organic gastric affections, and all wasting diseases, chronic or acute, in children or in adults. On this account it is more nourishing than milk from the maternal breast, and much more acceptable to irritated and inflamed digestive tracts.

Pepsin when administered should follow the food by perhaps fifteen minutes, and is often advantageously given in a little weakly-acidulated fluid; also it is sometimes advisable to add some stomachic to each dose for the purpose of stimulating the action of the stomach, when the so-called concentrated glycerole of the remedy is preferable, one minim of which as prepared is supposed to be capable of digesting one hundred grains of albumen. By its aid the difficulty of making durable liquid preparations of pepsin is overcome. Thus—

℞ Glycerole of pepsin (*pepsinum ovis*), ♏clx;
Hydrochloric acid (U. S. P.), ♏lxxx;
Glycerin, ʒvss;
Water, sufficient to make ℥xvi.

This forms a very satisfactory solution, possessing slightly acid reaction.

Also an elixir of pepsin may be made, equally efficient and of like reaction, and is most available for infants because of the combined stomachics and carminatives.

℞ Glycerole of pepsin (*pepsinum ovis*), ♏cxl;
Hydrochloric acid, U. S. P. (or lactic acid, ♏lx), ♏xxx;
Water, ʒii;
Aromatic elixir, sufficient to make ℥xvi.

Each fluidounce contains the equivalent of forty grains of saccharated pepsin, U. S. P., or, in other words, one grain of pure pepsin (P., D. & Co.'s). There is not sufficient alcohol in the elixir aromatic, usually, to materially interfere with the action of the pepsin.

The elixir is just four times as strong in pepsin, and the dose may be regulated accordingly; but it must be remembered also that doses are to be regulated largely by the age and condition of the patient.*

* So long ago as 1856, Joulin and Corvisart (*Rev. Méd.-Chir. de Paris*) outlined this mode of treatment, and claimed the happiest results therefrom; and more recently it was advocated by Trousseau, Pidoux, Barthez, and Rilliet, of France, and Ellis and Davidson, of the United Kingdom. Later still, Dr. J. Milner Fothergill ("Handbook of Practice," p. 40) remarked of pepsin: "Its utility in the treatment of imperfect digestion, and diarrhœa in children, is certain." Professor J. Lewis Smith (Professor of Diseases of Children, Bellevue Hospital Medical College, *Archiv. of Pediatrics*, 1866, p. 518) expresses exactly the same opinion. Professor Frederick John Farre (Pareira's "Mat. Med. and Therap.," p. 943) commends pepsin "*very highly in cholera infantum and summer complaints of children.*" And Bartholow declares ("Mat. Med. and Therap.," p. 68): "Very great success has been attained in the treatment of the *diarrhœas of infants* by pepsin. . . . The motions will be quickly changed in character, and the nutrition of the child improved, by giving it immediately after each supply of food." He further recommends (Naphey's "Medical Therapeutics," p. 395) the employment of peptonized milk or milk-gruel for food in these cases, in which

In diarrhœal disorders, lactic acid has obtained some celebrity because of its supposed antiseptic effect, whereas the real secret is its aid to gastric digestion, and the production of pepsin in the stomach; and for this reason it is an excellent medium for the exhibition of the gastric ferment. During treatment by the digestive ferments, little nourishment should be allowed, comparatively, but cool (boiled) water fed instead; and the little food permitted will be none the worse if diluted and pancreatized. At night all feeding should be interdicted, though cold (boiled) water slightly sweetened with loaf-sugar may be allowed. Slightly sweetened water is more palatable, and more readily quenches thirst than water alone, besides, is slightly nourishing. Much as mother's milk is desired in these cases, the very anxiety of the parent oftentimes exerts a most pernicious effect upon the mammary secretion. Therefore, in all serious diarrhœas, hand-feeding is best substituted. Apropos of this, it may be remarked, that in the orphan asylum at Rochester, N. Y., fatalities from diarrhœa altogether ceased by interdicting food, except at comparatively infrequent but regular intervals. The order was, "Feed only every three hours during the day; not at all at night; but allow water at all times." But the nurse, by some misunderstanding, fed the little ones *only thrice daily*. The moral is obvious!

DETROIT, MICHIGAN, July 4, 1889.

THE EFFECT OF THE ENTRANCE OF AIR INTO THE CIRCULATION.

BY H. A. HARE, M.D. (UNIV. OF PA.).*

BOTH from the side of physiology and practical medicine this question is one of great interest to every one. At the present time we are taught by all text-books and lecturers that the entrance of air into a vein is one of the most serious complications which may occur during an operation, and that in the vast majority of cases such an accident is followed by death. The object of this paper is to show that there is by no means so much danger as is thought, and to prove by actual experiment that the air on entering a vein is not capable of exerting deleterious influences. In a series of experiments, recently carried out in the University of Pennsylvania, on over seventy dogs the results which follow were obtained, and it is only because I have so large a mass of material that I am bold enough to contradict the wide-spread belief of most surgeons.

As it is not only impossible but unnecessary to give all the records of my experiments, I shall simply detail a few whenever it is necessary for me to illustrate a fact, asserting at the same time that the result of each was absolutely identical in proving that the entrance of air into a vein, at least in one of the lower animals, is not dangerous.

The quantity of air so injected by me into the jugular vein of these animals has varied from a minute bubble to forty cubic centimetres, and the rapidity of injection has been almost instantaneous,—as rapid as the piston of the syringe could be shoved downward. As the dogs have been of all ages, sizes, and breeds, and in all states of health, it would seem that no doubt can exist as to the correctness of the results. Further than this, in view of the importance of this question and the many sources of error, I have tested all joints and escapes in the instruments used, have employed anæsthetized and non-anæsthetized animals, and have even gone so far as to send for my friend, Dr. de Schweinitz, to come and bear witness to the result, and to examine all the appliances to see that no leak occurred. The following experiment, which is a sample of all the rest, may be of interest:

Dog; weight, 45 pounds; setter; full grown. (No ether.)

A.M.

11.05 Injected twenty cubic centimetres of air into left jugular vein in less than a second with a syringe.

11.15 No change in any way noticed, save that breathing may have been quickened for about one minute after injection. Is moving around room, perfectly happy and frisking about.

Next day.—In perfect health.

Seventh day.—In perfect health.

The following tracings of the effect of air so injected seem to be of sufficient interest to make their insertion here worth while. Two doses of air within a few seconds of each other are here seen to cause but a slight fall in pressure, which was at once recovered from, and a slight diminution of pulse-rate.

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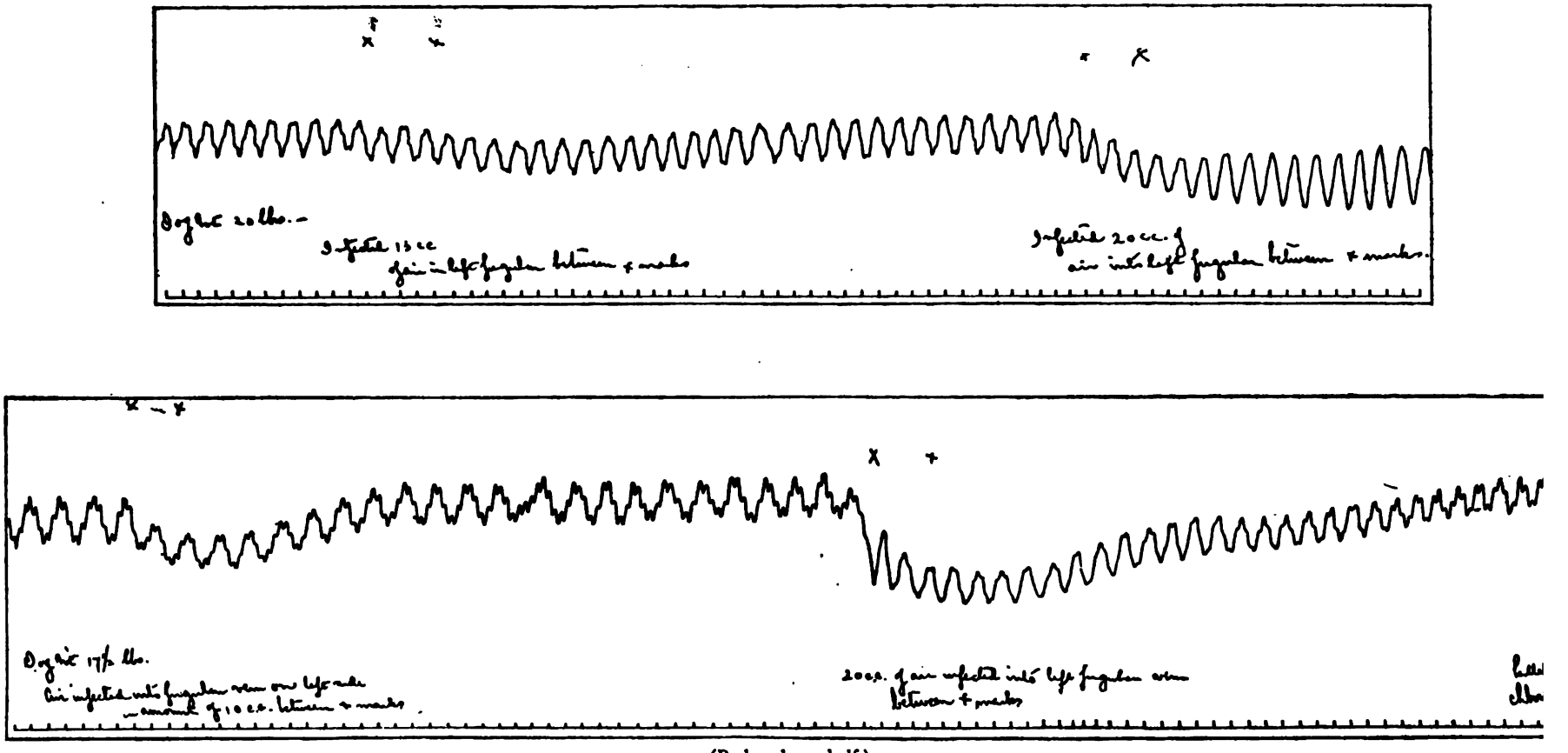
he is supported by Wilson Fox ("Diseases of Children," ii. p. 821), who considers "pepsin invaluable in gastralgia, and all irritative states of intestinal, stomach, and mucous membranes."

* Demonstrator of Therapeutics and Instructor in Physical Diagnosis in the Medical Department and in Physiology in the Biological Department of the University of Pennsylvania, and Physician to St. Agnes's Hospital.



(Reduced one-half.)

These are the results reached from the entrance of air into the jugular vein, in every quantity up to far above any amount which may enter because of a wound; and I shall therefore turn to the effect of the entrance of air into the carotid artery. Under such circumstances the results are quite different from those seen after opening of the jugular vein, but, nevertheless, totally disprove the theory that it is by cardiac failure that death under such circumstances occurs.

When air in as large an amount as twenty cubic centimetres is injected into the carotid artery, in from one-half to one second, respiration ceases at once, unconsciousness asserts itself, and the animal is apparently dead, save for the action of the heart, which keeps on as if nothing had occurred. In a moment respirations are renewed, the breathing becomes at first more powerful, then less and less so till death really ensues,—a result which can be indefinitely postponed provided artificial respiration is kept up. Sometimes the animal begins to breath voluntarily and lives independently of any such aid; in others he dies at once when the artificial respiration ceases. The two following experiments show these points very clearly:

Dog; weight, 40 pounds; mongrel spaniel; full grown. (Ether given while artery was secured.)

P.M.

3.40 Injected forty cubic centimetres of air into right carotid artery.
Animal at once stopped breathing and became unconscious.

3.41 Artificial respiration with hands compressing chest.

3.43 Voluntary respiratory movements.

3.44 Respiration has ceased; renewed artificial respiration.

3.46 Breathing voluntarily again; consciousness complete; some opisthotonos; hind limbs seem paralyzed; fore limbs intact; pupils of eyes and eyelids react normally to light and touch.

3.50 Respiration, 40 per minute.

3.55 Same state; howls every few minutes; tries to rise.

5.00 Same state, except opisthotonos is gone; hind limbs still palsied.

5.20 No change; killed by chloroform.

Dog; weight, 42½ pounds; hound; full grown.

P.M.

4.10 Injected twenty cubic centimetres of air into right carotid artery in one second.
Animal at once became comatose and ceased breathing; heart going well. Artificial respiration kept him alive for twenty minutes, when he died solely because compressing chest did not give him quite enough air. There was not a single sign of opisthotonos or palsy in this dog.

There are several interesting points in these two studies. First, the fact that air entering the carotid seems productive of the most serious consequences, while air entering the jugular vein does not; and, second, that the dose of twenty cubic centimetres of air proved as hurtful as did forty cubic centimetres. The same result as to the influence of air in the carotid artery was stated to be the case many years ago by the senior Professor Gross.

Having given the results as reached by me in these studies, it may not be out of place to sum up briefly the evidence we possess of an affirmative nature in regard to the matter in hand.

One of the most thorough studies of the subject so far published is undoubtedly that of Wattmann,* from whom most of the following information is derived unless otherwise stated. The first experiments of this kind are attributed to Wepfer, who is said to have killed an ox of stupendous size by blowing air with his mouth into its jugular vein,† while Redi, in a letter to Steno, written over two hundred years ago, stated that he had killed in a similar manner two dogs, a horse, a sheep, and two foxes. Similar studies have also been made by Heyde and Brunner. Ruysch, Valsalva, Morgagni, and others have at autopsies recorded the appearance of quantities of gaseous fluid in the vascular system which they believed to be air. Very much later Bichat‡ made startling announcements as to the small amount of air required to cause death when so introduced, but Nysten,§ a few years later, showed the fallacies in Bichat's assertions.

In 1818 a patient of Beauchêne, at the Hôpital Saint-Antoine, while he was extirpating a tumor of the right shoulder and lateral and lower part of the neck, died very suddenly "under circumstances which made him believe that this was occasioned by entrance of air into the vascular system through an opening in a vein." Further cases have since been reported by writers in this country and abroad by Amussat,‖ Mott, and others.¶

* "Sicheres Heilverfahren bei dem schnell gefährlicher Lufteintritt in die Venen und dessen gerichtsarztliche Wichtigkeit," Wein., 1843.

† Morgagni, "De Sedibus et Causis Morborum," epist. v.

‡ "Recherches Physiologiques sur la Vie et la Mort."

§ "Recherches de Physiologie et de Chimie Pathologique," 1811.

‖ "Archives Gén. de Médecine," tome i., 3d serie, p. 112.

¶ "Medical and Surgical History of the British Army in the Crimea, 1854–56," vol. ii.

The paper of Amussat is one of the most exhaustive of its kind, but its conclusions were vehemently attacked by men no less noted than Velpeau,* Gerdy, Blandin, and Mallé, all of whom asserted that the symptoms detailed were not to be thought due to the entrance of air, but to other extraneous causes.

In the experiments of nearly all the early investigators the air was introduced by blowing with the mouth or a syringe, but Amussat carried out a series of studies in which he opened the jugular vein and allowed any air to enter that could do so.†

The experiments in England have been very imperfect as compared with those in France, the best contributions being those of Erichsen.‡

In America, so far as I am aware, no studies have been made up to this time; and while the general opinion is at present against my results, I am glad to say that a very great deal of support and endorsement can be obtained for them,—not from those who have had no sure evidence to base their assertions upon, but from the men who, from a practical and experimental stand-point, are best qualified to give opinions. I shall, however, in justice to the subject before us, give the evidence upon both sides of the question.

The experiments of Nysten§ proved that only large amounts of air produce fatal results, the quantity varying from forty to one hundred and twenty cubic centimetres, according to the size of the dog, and he also found that larger amounts must be used to kill the ox or horse.

Magendie states that he has thrown, with all the force and celerity of which he was capable, forty or fifty pints of air into the veins of a very old horse without his dying immediately, and Cormack‖ blew the contents of his chest, twice filled, into the jugular vein of a horse before the animal exhibited any signs of uneasiness. Barthelemy has also found that in six horses, weakened greatly by the withdrawal of blood, as much as from four to six litres of air must be introduced intravenously to cause death, and estimates, in consequence, that a man weighing one hundred and thirty-six pounds would be killed only by two-thirds of a litre. Even the experiments of Amussat force him to the conclusion that a considerable quantity of air must be used to cause death. Oré¶ finds eighty cubic centimetres necessary to cause death in the dog.

The conclusions to be reached, therefore, from all experimental researches is that enormous amounts of air must enter a vein to cause death, and that no such quantity can possibly find its way into a vein which has been injured with the knife of the surgeon. These are the facts *against* the prevailing idea; let us see what the facts are *for* it. The answer is that there are none. While we have a large number of cases reported of sudden death under operations where veins were opened, in the majority of them the cause of death has been guessed at and not proved. The only case which approaches in any way towards authenticity is that of Mott, who saw a serious but not fatal result induced by the entrance of air into the facial vein, and even this is not a proved case. The case of Barlow** is equally doubtful as to the real cause of death.

There are a number of cases on record where death has resulted, according to the physician in charge, from the entrance of air into the uterine sinuses. These I have not room for here, and they are somewhat different in their character,—in that the character of the accidents and the peculiar anatomical arrangement of these veins render the entrance of large amounts of air more easy of accomplishment.

Supposing that ordinary atmospheric air is really capable of acting in the manner generally thought, the question arises as to the method of its influence. Erichsen believes it to be due to the frothy state of the blood, which prevents the due transfer of the circulating fluid through the pulmonary tissue, and Bell believed death to be due to the transferrence of air to the base of the brain.

Cormack has thought death to be due to gaseous distention of the heart, and Moore thought it to be due to the entrance of air into the cardiac cavities. Other observers have found air in the right heart, and concluded that in this way the blood is prevented from eventually getting to the lungs and general system. Again, it has been thought that the air prevents the closure of the valves of the heart or that the bubbles of air entering the smaller capillaries acted as emboli.

* *Gazette Médicale de Paris*, February 2, 1838.

† "Recherches sur l'Introduction Accidentelle de l'Air dans le Veins."

‡ *Edinburgh Med. and Surg. Journal* for January, 1844.

§ *Loc. cit.*

‖ "Prize Thesis," August, 1837.

¶ *Gazette Hebdomadaire*, 1863, p.33.

** *Medico-Chirurgical Trans.*, xvi., Part I.

Taking up the last theory first, we find, in the first place, there is no evidence whatever to prove that air may not be driven anywhere that blood can flow, and it is, to say the least, curious that any one should suppose that a bubble of air, which is compressible in itself and capable of assuming any form under pressure, should form an impassable barrier against which a blood-pressure of two hundred millimetres could press in vain,—a pressure made up of blood, a virtually incompressible body. This seems to be sufficient evidence of the falsity of any such theory.

Again, why should the air in the cavities of the heart prevent the valves from closing? We are accustomed to test the tightness of rubber bags by inflating them with air or water, and if the valves can close on a current of blood, why can they not do so upon a current of blood and air mixed? If air was as heavy as mercury, and as difficult of propulsion, such a theory might stand.

Even the theories of the causes of the supposed deaths in man do not, therefore, stand before a rigid examination, which is hardly to be wondered at when we have proved that the quantity of air entering the veins under such circumstances cannot be of any great quantity.

According to Ashhurst and Agnew, the veins of the neck are the ones most liable to be entered by air, and it is said by Agnew that the frequency of this accident is due to the fact that the venous trunks in that region are in many places attached to the deep fascia, which prevents collapse of their walls when wounded; for this reason this part of the body is spoken of as the "dangerous region," according to Ashhurst.

The explanation of the method by which the air finds entrance to the veins is supposed to be by a process of suction produced by the expansile movements of the chest in inspiration. Practically, most surgeons will agree with me in stating that generally the blood-pressure in the jugular vein is sufficient to cause so great a hemorrhage as to prevent any air entering the vein; and I have proved the fallacy of the suction theory any number of times by leaving an open canula in the jugular vein, the vessel being tied above to prevent hemorrhage.

It still remains to be explained why air injected into the jugular vein is not followed, unless in excess, by bad symptoms, while the same doses kill when sent into the carotid artery. I confess that any explanation I can offer is but a hypothesis. My theory is that the air in small amount on entering the right side of the heart is, when sent through the pulmonary blood-vessels, expired with the rest of the gases therein contained; and it is only when so large an amount is injected that some of it reaches the left side of the heart that death ensues, owing to the formation of minute clots which act as emboli. That such clots are not formed in the jugular vein seems probable from the results reached and from the fact that venous blood coagulates more slowly than arterial blood. The injection of large amounts of air into the carotid where arterial blood is present may cause clots and resulting emboli,—a theory still further supported by the symptoms of paralysis or spasm shown by the animals used. It can hardly be supposed that air is a poison in itself to the brain and its centres, particularly the respiratory centre.

Conclusions.—1. Death never occurs from the entrance of air into the ordinary veins of the body unless the quantity be enormous,—from one to several pints, a quantity which cannot enter unless deliberately sent in by the surgeon.

2. The cases on record have been due to other causes than air and have not been proved.

3. The tendency of the vessel to collapse and the leakage of blood prevent any entrance of air, and it would seem probable that a clot has generally caused death, not the air itself.

BROMIDE OF POTASSIUM AS AN ANTIDOTE TO IODOFORM.

A case of resection of a carcinomatous rectum is referred to in the *Wiener Medizinische Blätter* for July 11, 1889, in which symptoms of poisoning were produced through the use of iodoform. Under the use of bromide of potassium rapid relief was obtained. This condition is explained by SAMTER and RETZLAFF as due to the fact that bromide of potassium exceeds all other salts in its power for dissolving iodine compounds. They state that if a test-tube be half filled with a solution of potassium bromide (1 to 3), fifty drops of tincture of iodine may be added without the iodine being displaced from its solution with the potassium bromide. This condition persists for several days, and bromide of potassium, of all the different salts recommended in iodoform-poisoning, is the only one which is capable of retaining the iodine in permanent solution.

The Therapeutic Gazette

EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

CHLORALAMIDE—A NEW HYPNOTIC.

IT is usually the case that most diseases for whose cure we find a long list of remedies recommended are practically incurable, and it may ordinarily be safely assumed that no one of the remedies recommended possesses any extraordinary value. If we may apply this argument to the treatment of symptoms, insomnia should be the most rebellious of all affections, for the list of hypnotics is already a superlatively long one, and is continually receiving new additions.

Yet it is a well-known fact that in individual cases nearly all hypnotics may fail. One patient may be put to sleep by cold applications on the neck, another must have chloral, and still a third, as has been suggested in the *Wiener Medizinische Blätter* for August 1, 1889, may be put to sleep by "suggestion," while, finally, in another case, every means will fail.

The last addition to the list of medicinal hypnotics is chloralamide,—a combination of chloral and formamide. This substance is described by Dr. Rabow in the *Centralblatt für Nervenheilkunde*, August 1, 1889, as possessing the formula of

$$CCl_3CH<\begin{matrix}OH\\NHCHO,\end{matrix}$$

and occurs in colorless, odorless crystals, which have a faintly bitter taste, and which melt at 115° C. It is soluble in 10 parts of cold water and 1 part of absolute alcohol. It is more readily soluble in warm water, yet the temperature must not be raised above 140° F., since at this point separation of the two components readily occurs. Weak acids or nitrate of silver have no effect upon this solution; while, on the other hand, it is decomposed by caustic alkalies and alkaline carbonates.

The name chloralamide is by no means a satisfactory one, since the substance is a chemical compound of chloral and formamide, and should, therefore, be described as a chloral formamide or as formidate of chloral.

Professor Rabow states that numerous experiments on animals and men proved that this remedy, in doses of from 15 to 60 grains, is capable of producing sleep, and although sleep does not follow its administration as soon as after the use of chloral hydrate, it yet appears much earlier than after the use of sulphonal.

The writer claims that he has never observed any unfavorable influence of this substance on the digestive organs, but he states that he does not feel warranted in giving any opinion as to its action on the circulation, leaving that to be determined by subsequent study. He claims, however, that the uncomfortable and prolonged after-working of sulphonal is not produced by chloralamide, while its solubility is a further recommendation of the latter.

The doses which he administered varied between 15 and 60 grains, given in the form of a powder, in capsules or dissolved in wine or beer, recommending as the best means of administration that it be given in tea or mulled wine.

To produce satisfactory sleep chloralamide must be given in somewhat larger doses than chloral hydrate, 45 grains of the former corresponding to about 30 grains of the latter. In the author's experiments, sleep followed within twenty-five to thirty minutes after its administration, and lasted from six to eight hours.

Dr. Rabow has found that in doses of from 45 to 60 grains it is quite useless in mania or cases of maniacal excitement; while, on the other hand, it has proved highly reliable in the nervous insomnia of neurasthenia and hys-

teria, and in sleeplessness from alcoholic excesses.

He has employed it in fifty-two different instances, in but few of which was any failure noted; no disagreeable effects were in his experience ever produced.

Dr. Hagen and Dr. Hüfler, assistants in the medical clinic in Erlangen, have also brought forward a number of observations on the use of formamide (*Pharmaceutische Post* for August 8, 1889), in which they confirmed the favorable opinions given above. They employed it in doses of 30 to 45 grains, and found it especially efficacious in cases of insomnia depending upon nervousness, and, in fact, most cases of sleeplessness which do not depend upon pain. These authors report in the *Wiener Medizinische Blätter* for August 1, 1889, that they have experimented on twenty-five patients and three healthy individuals, giving in all one hundred and eighteen doses.

Sleep was produced in twenty-six cases, and only failed in two, of which one was a case of paralytic dementia and the other an advanced case of phthisis. Comparing chloralamide with chloral, the authors give the impression of preferring chloralamide to chloral on account of freedom from taste, greater efficiency in producing sleep, and freedom from dangerous or disagreeable after-effects, although in some cases a slight headache remained on awakening from sleep. The chloralamide seemed incapable of subduing pain, although in cases of cardiac asthma it seemed to act almost as a specific.

In Professor Strumpell's clinic 30 grains were generally found sufficient, especially in women, although occasionally 45 grains were required, given in capsules or dissolved in wine. No disagreeable effects on the heart, respiration, temperature, digestion, or kidneys were ever noticed.

In the *Deutsche Medizinische Wochenschrift*, August 1, 1889, Dr. Reichmann likewise publishes a paper on the use of chloralamide. Dr. Reichmann commenced his investigations by the administration of 45 grains to a medium-sized dog, and although the dog seemed somnolent no actual sleep was produced, and no effects of any kind were noted. But although this experiment gave an absolutely negative result, he states that his experiments have shown him, on the other hand, that chloralamide is a reliable and active hypnotic, and entirely free from any unpleasant after-effects. He commenced with the administration of 15 grains, and extended the dose until 45 grains were administered, and obtained a much better result with the latter amount. Contrary to what has been experienced by others who have studied this drug, Dr. Reichmann states that he has even found chloralamide will produce sleep where pain may be the cause of the insomnia, and he refers to the cause of a woman suffering with colic from gall-stone, where sleep was produced by 45 grains of chloralamide.

This also occurred, as a consequence of a dose of 60 grains, in the case of a lady suffering from violent neuralgia, even though the patient was addicted to the use of morphine. The author has likewise studied the influence of chloralamide on the circulation by means of the sphygmograph, and found it was entirely free from any undesirable effects.

In the *Deutsche Medizinische Wochenschrift* for August 8, 1889, Dr. Peiper likewise publishes a paper on the use of chloralamide, giving notes of twenty-four cases in which it was used as a hypnotic, administered in the form of a powder, followed by milk or weak coffee.

In four cases it was given as an enema, and the latter mode of application was found very satisfactory, no irritation being produced even from frequent repetition, although its action was somewhat slower than when given by the mouth.

Dr. Peiper likewise found that in nearly all cases 30 to 45 grains were quite sufficient to produce sleep, and in one case, that of a child 11 years old, sound sleep for more than three hours resulted from a dose of 7 grains. Sleep generally occurred in one-half to three-quarters of an hour, and persisted for seven to eight hours. On the next morning these patients complained of great fatigue and desire for sleep, as a consequence of a dose of 45 grains each. Three patients complained of headache the next day and one of dizziness, while no effects of any kind were noticed on the pulse, respiration, or temperature, although they complained of more thirst than usual on awakening.

Dr. Peiper likewise found that the effects were most satisfactory when given in insomnia from nervous affections, and believes that its action was more marked than that of chloral.

The opinions, therefore, of a number of separate observers seem to indicate that chloralamide promises to be a valuable addition to our list of new drugs. The unusual part of the testimony, which has so far been offered, is that so many different observers should simultaneously experiment with an entirely new drug, since we find that all the papers alluded

to above are published within one week of each other. This is, perhaps, explained by the fact that the drug is introduced by a German manufacturing chemist at the suggestion of Professor von Mering, and we infer from that that chloralamide, like a number of other drugs of similar source, is protected by a patent. We have no means as yet of averring that positively, but the manner of the introduction leaves little doubt as to the accuracy of our supposition. That being the case, we would require more independent observation before giving any opinion as to the actual value of chloralamide.

HYPNOTISM.

THE subject of hypnotism and its therapeutic employment has attracted so much more attention upon the continent of Europe than in North America that it seems necessary in writing concerning it for the general American reader to make certain fundamental statements, which are to those versed in the matter very trite. First, it is certain that the facts of hypnotism are really facts,—*i.e.*, it is sure that by very simple processes most individuals, at least of some races and many individuals of all races, can be thrown into a condition of perverted consciousness, in which they are automatisms, controlled by the will of the operator,—insensitive in such portions of the body as he declares are devoid of feeling, sensitive when he declares sensation exists,—physically, morally, seemingly in all respects an *alter ego* to the man who commands them. Second, it seems indisputable that relief, if not cure, has been obtained in cases of disease by means of hypnotism. The scope of the present journal naturally leads us to confine our attention to considerations connected with the last proposition.

As long ago as 1866, Tiebault, of Nancy, published the first book discussing the treatment of disease by hypnotism, but it was not until the attention of Professor Bernheim was attracted to the subject that the importance of the steady, persistent, clinical work of Tiebault received recognition. Professor Bernheim's book appeared in 1884, and to-day almost every large city of Europe has one or more clinicians devoted exclusively to the practice of the system inaugurated by Tiebault, while the literature of the subject would fill several book-shelves.

The method of treatment is simply by suggestions made during the hypnotic state. Take, as an example, a case of painful menstruation in a neurotic patient. Once or twice, a few days before the menstrual period, the woman is put to sleep, the hypnotism being carried not further than the deepest condition of the first stage,—*i.e.*, that of catalepsy. Then she is told, in a moderate but very commanding tone of voice, you will not have any pain at your next period. "No pain at your next period" is repeated half a dozen or more times, and, after sleeping a few minutes longer, the patient is wakened. It is affirmed that it is much preferable that the sleep be so performed that the woman has no remembrance of what has been done. As the writer of this editorial has seen, by this simple management, without the aid of any other moral, physical, or medicinal treatment, a woman who has been accustomed to be disabled one or two days during each month is enabled to pass through menstrual period after menstrual period without suffering.

Especially by Tiebault, Bernheim, and Beaunis, of Nancy, the hypnotic method of treatment has been used with asserted almost miraculous results in a great variety of chronic disease. Rheumatism, gout, chronic constipation, diarrhœa, general debility, are affirmed often to yield to the process. It is "extremely useful in cramp from the overuse of certain muscles" (writers', telegraphers', etc., cramp), and "is very successful also in cases of old-standing paralysis, and especially so in the infantile variety." Professor Delbœuf, of Liege, made upon each of the two arms of a man a similar burn with caustic, told him, while hypnotized, that one would heal with suppuration, one without, and so it happened. Focachon has blistered severely with postage-stamps, backed up by hypnotic suggestion; the deaf have been made to hear; the immoral have been reformed; bad children made good; and Tiebault even believes, although his experiments have not yet been brought to a satisfactory conclusion, that by hypnotizing and suggesting to the pregnant woman the fœtus can be physically educated in the uterus, and indefinitely hurried forward towards Apollo-like beauty and Minerva-rivalling wisdom. If the assertions of devotees of hypnotism can be made good, if their predictions shall be fulfilled, Christianity, as a reforming, perfecting force, will pale utterly before the power of a bright button.

However much we may be inclined to doubt, it must be acknowledged that wonderful things have been done. The writer saw at Professor Luy's service at La Charité a man in

whose case the diagnosis of paralysis agitans had been made—who certainly for four years had been so tremulous that he was unable to feed himself or perform the ordinary acts of life—cured by hypnotism so as to be able to run in and out through the wheels of carriages about the Paris Exposition selling tickets; that this was, however, truly a case of true paralysis agitans the writer does not believe, the whole appearance of the patient suggesting a hysterical mockery rather than a true sample of the hitherto uncurable disorder.

The rapid spread of the system and the results said to be achieved, certainly require that American physicians shall make for themselves clinical studies; although it is true that in Charcot's clinic at the Salpêtrière, after trial, hypnotism has been abandoned as a therapeutic measure, and that at Vienna Meynert refuses to employ it because, as he says, it weakens the will of the hypnotized person, whereas what is desirable in neurotic subjects is to strengthen the will. There are also other lions in the path. The deeply hypnotized subject is so thoroughly under the control of the operator that he or she can be made to permit or commit criminal acts, and in Holland and Switzerland the law has already forbidden the public exposition of the hypnotic state. There are very few persons who can be put to sleep without their own active, or rather passive, co-operation, but it is probable that, after a long course of hypnotism, the operator may gain almost complete control over the subject. At any rate, it should be an absolute rule that under no circumstances should the medical practitioner induce hypnotism, except after the full consent of the subject and in the presence of a third person.

Most, if not all, of the advocates of hypnotic therapeutics teach that the state has no relations with hysteria, and that the therapeutic results are the direct effect of the suggestions made by the operator, and are best obtained where the subject has no knowledge of what has been said. They believe that the nervous system is thrown into such a condition that impulses coming from the suggestions made by the operator have an effect upon trophic and circulatory nerves much more powerful than can occur during the normal state. Charcot, however, is probably correct in asserting the very close relation between hypnotism and hysteria, and it does not yet seem necessary to believe that the cases have been affected by the words of the operator acting without the knowledge of the patient. Take the case of the woman spoken of early in this editorial. She had no remembrance of what had been said to her during the hypnotic sleep, but she knew that she came to the doctor to be cured of her menstrual pains, and that some most mysterious and, to her mind, all-powerful series of acts had been performed upon her for the purpose of curing her. This certainly was a sufficient basis for a cure produced by a mental impression. In other words, it seems still possible to believe, or, at least, it does not yet appear to be disproven, that hypnotism, like the magnet, the metallic tractors, metallotherapy, etc., is simply a means of powerfully impressing neurotic subjects by acting upon their conscious mentality, and thereby influencing the lower nervous system. Of all known plans for therapeutically appealing to the imagination and for impressing patients, hypnotism seems to be the most powerful. A more uncanny sight than a room full of people sleeping, contorting, marching, etc., at the will of one man it is not often given mortals to see.

HYDROXYLAMINE.

IN 1865 the chemist Lossen discovered a substance capable of forming salts, and having the formula $2H_2O + NH_3OH$, to which he gave the name of hydroxylamine. The toxicological property of it and its salts was studied in 1888 by Professor Binz, who found that it produces in the lower animals stupor, convulsions, hæmaturia, and discoloration of the blood, the latter change being due to the formation not only of methæmoglobin, but also to the reduction of this substance in part to hæmatin. In his experiments the physiological action of the hydroxylamine so closely resembled that of pyrogallic acid, chrysarobin, anarobin, and allied substances, which have been found serviceable in the treatment of psoriasis, that he suggested its use in skin-affections.

The physiological action of hydroxylamine has during the present year been further studied by Professor L. Lewin, of Berlin, who has not added very much positive information to the results previously obtained, but has determined that it affects dead and living blood similarly, and that its action upon the corpuscle is probably due to its decomposition, and the liberation of nitric or nitrous acid.

The practical suggestion of Professor Binz has led to trials of the drug by the German

dermatologists, and especially to a careful study of it by John Fabry (*Archiv Dermat. et Syph.*, Heft ii., 1889). This clinician found that a ten per cent. solution is excessively irritant to almost all skins, causing intense redness, violent burning, sweating, and not rarely blistering the part. Some skins will not bear a one per cent. solution, so that it is not safe in a new case to begin with a stronger application. The solution should be gradually increased, and be applied at intervals of one, two, or three days, according to its effects. In the cases studied by Fabry, the results were most favorable. One very severe example of chronic psoriasis, which had resisted other treatment, had the ordinary solution of pyrogallic acid applied to one arm, to the other the solution of hydroxylamine. At first the arm treated with the acid appeared to improve most rapidly, but in a few days the other arm overtook and passed it on the road to recovery, and was well some time before the other.

Two formulæ have been used by Fabry, the one spirituous, the other aqueous.

Hydroxylamine muriate, 2 to 5 parts;
Alcohol, 100 parts;
Chalk, sufficient to neutralize.
Mix and filter.

Hydroxylamine muriate, 1 part;
Water, 1000 parts;
Chalk, sufficient to neutralize.
Mix and filter.

The great advantage which hydroxylamine has over pyrogallic acid, anarobin, chrysarobin, and other previously used substances is, that while the latter always deeply stain the skin, it is entirely free from color and from dyeing properties.

THYROIDECTOMY.

GOITRE is such a rare disease in the United States that the subject of its operative treatment is of but little practical importance for most of our readers. Nevertheless, the results obtained are so mysterious that perhaps a few words concerning them, as at present illustrated in the wards of Professor Theodor Kocher, of the University of Berne, may not be devoid of interest. As is well known in the great majority of cases, myxœdematous diseases, after a time, follow the complete removal of the gland. This Professor Kocher has found may be avoided by leaving in the neck one lobe, or even part of a lobe, of the gland. By means of careful antiseptics the operation is so robbed of its terrors that we have seen a patient four days after it entirely well, the wound being completely healed.

A very bold experimental operation for the relief of the myxœdema, which has followed complete removal of the gland, is now under trial. It consists in inserting a fresh, healthy piece of the gland in the abdominal cavity, with the hope that it may form attachments and perform its mysterious function. In one case, probably by pressure upon the large intestines, the inserted mass, after the complete healing of the wound, caused such violent colicky attacks that it had to be removed, but in most instances no evil effects have followed the insertion. What becomes of the transplanted gland is not yet known. A case was recently shown us that had been operated upon about three months previously, in which the presence of the gland in the abdomen could apparently be still demonstrated by palpation, etc., and in which, the patient asserted, his general condition was much better than before the abdominal section. It will be a very strange physiological fact if it should be found that the transplanted gland has the power of taking root and adapting itself to its new environments. It is, perhaps, allowable to add that the glandular masses for transplantation have been taken from the necks of individuals with hypertrophied thyroids.

CORONILLA—A NEW HEART REMEDY.

CORONILLA SCORPIOIDES, the annual plant from which this remedy is obtained, belongs to the family Papilionaceæ, suborder Coronillæ, and is widely distributed through the southern parts of France. From experiments made on animals, Dr. Cardot has determined that the coronilla arrests the heart of the frog in systole, and in his inaugural thesis sustained in Nancy in 1886 he refers to four cases in which this remedy had produced considerable amelioration in various cardiac affections.

Dr. Cardot's statements, however, attracted but little attention until recently Schlagdenhauffen and Gley and Spillman have again called attention to this subject in papers read before the Société de Biologie, while finally, quite recently, Schlagdenhauffen and Reeb (*Revue Générale de Clinique et de Thérapeutique*, July 25, 1889) state that they have isolated a glucoside from the coronilla, which they term

coronillin, of which the toxic dose would amount to ¾ of a grain for a man weighing about one hundred and twenty pounds.

Nevertheless, the authors maintain that to produce any therapeutic effect, 2 to 3 grains must be administered, or from 9 to 22 grains of the extract. The remedy is stated to act especially on the myocardium, whose contractility it increases.

Dr. Spillman has employed it in seventeen cases of heart-disease, administering it in the asystolic period. In eight cases the remedy is stated to have produced satisfactory results, in two cases it produced very slight amelioration, and in seven cases its therapeutic action was entirely negative. A diuretic effect was frequently observed, the amount of urine evacuated daily increasing in a few days from seven ounces to two to four quarts.

Coronilla is stated to act but feebly on the number and rhythm of the cardiac pulsation, but it is claimed to produce an increase in the amplitude of the pulse and augmentation of the diuresis, and diminution of œdema and improvement in the respiration.

In Dr. Spillman's case the remedy was administered for three or four days in succession, and the therapeutic effect was only perceptible after twenty-four to thirty-six hours after the administration of the first dose.

It appears that whatever good effects may be obtained from the use of this remedy, they are of the most transient character, since it is stated that twenty-four hours after the cessation of the use of this drug the patient's condition returns to its original state.

The value of the remedy is thus highly problematical, especially when we take into consideration, that while Schlagdenhauffen states that ¾ of a grain is a poisonous dose, that Dr. Spillman should, nevertheless, recommend the administration of from 3 to 5 grains.

Evidently further studies are required before any definite opinion can be expressed as to the value of this one of the most recently recommended remedies.

Reports on Therapeutic Progress.

INTESTINAL SURGERY.

Assisted by Mr. Victor Horsley, MR. FREDERICK B. JESSETT made an experimental investigation into the operative procedures suggested by Dr. Senn (*British Medical Journal*, July 27, 1889). His results confirmed Dr. Senn's conclusions, and show that there is no fear of any fæcal accumulation forming in the excluded portion of intestine, and that the treatment of intestinal obstruction by anastomosis must in the future be the recognized operation in the majority of, if not in all, cases of obstruction of the bowel, which cannot be overcome otherwise than by opening the gut.

The idea of establishing a fistulous communication between a portion of bowel above and below the seat of an obstruction originated with Maisonneuve, who operated on two patients, but with fatal results in both instances. The operation met with violent opposition at the Surgical Society of Paris, surgeons assuming that the excluded portion of intestine would become the seat of fæcal accumulations, which would ultimately destroy the life of the patient, even if he survived the operation. In the year 1863, Hacken, under the direction of Adelmann, made some experiments on dogs, but with no success; and the subject seems to have been completely forgotten until E. Hahn, of Berlin, drew attention to it again in commenting on his two cases of excision of the colon, when circular enterorrhaphy could not be performed, and an artificial anus was established. Both his patients recovered from the operation, but all attempts to close the preternatural opening proved futile.

The four modes of operating as suggested by Dr. Senn—that is, 1, gastro enterostomy; 2, jejuno-ileostomy and ileo-ileostomy; 3, enterorrhaphy; 4, ileo-colostomy—are described by Mr. Jessett as follows: Gastro-enterostomy and jejuno-ileostomy are performed identically in the same way by means of decalcified bone plates. They should have an oval opening in the centre three-quarters of an inch long by half an inch in width. To decalcify them, let them be placed in a ten per cent. solution of strong hydrochloric acid, and allow them to remain in this until they are quite soft and pliable; the acid solution requires to be changed about every second day, and usually the plates are thoroughly decalcified in the course of a week. They are then washed, and allowed to lie in plain water for some hours to get rid of the superfluous acid, and finally they are preserved in rectified spirit until required for use, when they should be placed in a twenty per cent. solution of carbolic acid for an hour before using them. In preparing these plates for operative purposes, four holes have to be drilled in them close to the edge of the cen-

tral oval opening,—namely, one on either side and one at each end. Through these openings four threads at least twelve inches long of No. 1 chromicized catgut or Chinese silk, each armed with a fine sewing-needle, are passed and fastened to a circular thread at the back, of the same material, which is formed so as to be a trifle larger than the oval opening. The plates being now ready for use are placed in a solution of carbolic acid.

Gastro-enterostomy.—In performing this operation, an opening some three inches in length is made in the middle line of the abdomen, between the ensiform cartilage and umbilicus, the omentum being pushed on one side; a piece of jejunum, as near to its origin as practicable, is drawn into the wound and held by an assistant; a portion of the stomach, about two inches from the greater curvature and as near to the pyloric end as possible, is also drawn into the wound. Two pieces of india-rubber tubing are next passed through the mesentery, about four inches apart, one on either side of the portion of gut to be opened, and, after this has been emptied of its contents by gently squeezing it, these india-rubber tubes are fastened sufficiently tightly to prevent the contents passing.

The portion of the stomach and intestine being now well outside of the wound, are packed round with sponges to catch any of their contents that might escape on their being opened. An opening about an inch in length is now made in a longitudinal direction into the convex surface of the jejunum, and one of the bone plates slipped in; the needles of the two lateral threads are then passed through all the coats of the bowel close to the cut edge, and unthreaded, the two end threads being brought out at either end of the wound in the gut; these threads are then given to an assistant to hold, while the surgeon makes another incision into the stomach parallel to the greater curvature; the other bone plate is then passed into this viscus through the incision, the needles of the lateral threads are passed through all the coats of the stomach, the end threads being, as in the jejunum, brought out through the wound.

The two openings are next accurately adapted to each other, and the bone plates held firmly in position by an assistant while the surgeon ties the corresponding threads of either plate tightly. The lower lateral threads should be tied first, then the end ones, and [illegible]lly the upper lateral. Should the ends of the bone plates be found to tilt, it is wiser to insert a Lembert suture at each end, but this is not always necessary. The jejunum being now firmly fixed to the stomach, the parts are dropped back into the abdominal cavity, the toilet of the omentum attended to, and the abdominal wound closed in the usual manner. This operation may be readily performed in from fifteen to twenty minutes, and was successfully accomplished on two dogs by Mr. Jessett and Mr. Horsley, both of which made uninterrupted recovery, never having displayed the slightest pain or inconvenience.

Jejuno-ileostomy.—If it is not desired to remove any portion of the diseased intestine, but simply to form an artificial communication between a portion of intestine above an obstruction and another portion below, the operation is conducted exactly in the same manner as that described for gastro-enterostomy. Should it, however, be deemed necessary to excise a portion of the gut, the operation will have to be modified somewhat. In this case, the intestine, being drawn well out of the abdominal wound, and gently squeezed at the seat of the operation, to empty it of its contents as far as possible, should be clamped, either by means of india-rubber bands or one of the numerous clamps devised for the purpose, about four inches on either side of the portion of diseased or injured bowel to be removed. Sponges should be carefully packed around the opening into the abdomen to prevent any fæcal matter that may escape from the divided intestine entering into the peritoneum, and the bowel cut directly across with scissors, and a V-shaped piece of mesentery also removed. All bleeding points being secured with fine catgut ligatures, the two ends of each portion of the bowel are to be invaginated into themselves, and, when invaginated to the extent of one inch, the serous and muscular coats of each are stitched together by means of a continuous catgut or Chinese silk suture. The two ends of the gut are next placed parallel to each other, with their convex surfaces in apposition. It is of importance to notice that the two portions of intestine are applied end on, so as not to interfere with the peristaltic action of the bowels. An opening about an inch long is made longitudinally in each portion of the gut on its convex surface, and the bone plates passed in and fastened in the same manner as already described for gastro-enterostomy. The divided mesentery is united by a few stitches of cat-

gut. This operation can be easily performed in twenty minutes.

The authors have performed this operation on dogs in six cases; in every case portions of the intestine varying in length from three to twelve inches were removed. All these dogs made an uninterrupted recovery.

Circular Enterorrhaphy.—This method, suggested by Senn and adopted in the investigations we are considering, is really a modification of Jobert's operation. In both operations, the proximal portion of the divided gut is invaginated into the distal end, and the sutures are passed through all the coats of the intestine, but Senn's operation differs from Jobert's in that he lines the upper end of the bowel with a soft pliable india-rubber band, which is cut the required length at the time of the operation, and formed into a ring by fastening the ends together with two catgut sutures. The rings that Mr. Jessett used were formed of a broad flat band of india-rubber, one-quarter to a half inch in depth; this is pushed into the lumen of the proximal end of the gut, which it should fit accurately. The ring is to be fastened to the lower end of the proximal portion of the bowel by a continuous catgut suture which prevents the bulging of the mucous membrane. Two chromicized catgut sutures about eighteen to twenty-four inches long and threaded at either end with an ordinary sewing-needle are next prepared, and the needle passed from within outward, transfixing the upper portion of the rubber ring and all the coats of the bowel. The posterior threads are passed one on either side of the mesentery, and the anterior needles at equal distances apart through the convex surfaces of the bowel.

The intestine above and below the seat of operation is either compressed between the thumb and fingers of an assistant, or by an india-rubber band passed round and lightly tied, or by one or other of the clamps made for this purpose.

The needles are next passed through the peritoneal and muscular coats of the lower portion of the intestine at corresponding points, about one-third or half an inch from the cut edge. An assistant now makes gentle traction upon all the threads, while the operator manipulates the two ends of the divided gut, so that the upper end becomes invaginated into the lower. Care must be taken that the margins of the lower end are turned completely and evenly in, so that the serous surface of the intussuscipiens is in close contact to that of the intussusceptum. The operator having satisfied himself that the upper portion of gut is completely invaginated, proceeds to tie the catgut sutures with sufficient firmness to prevent disinvagination.

The divided mesentery is next fastened together with a few interrupted catgut sutures, and great care should be paid to the mesenteric attachment of the gut at the point of operation, as it is here that the greatest difficulty is experienced in the invagination; in Mr. Jessett's experience it was always well to place a couple of Czerny-Lembert sutures, one on either side of the mesenteric attachment. After a few days the rubber ring becomes detached, by the absorption of the catgut sutures, and passes *per anum*.

The success of this operation can be greatly increased by applying either an omental flap or an omental graft around the seat of operation.

An omental flap, adopted by Senn and others, may be applied by cutting a strip of omentum about two inches wide and wrapping it round the gut, fastening it in place by a couple of stitches, one on either side of the point of union of the intestine, and passing through both surfaces of the flap and the mesentery, care being taken to insure that the sutures are passed parallel to the mesenteric vessels. The cut edge of the omentum from which the flap has been excised, after all bleeding points have been secured, should be united by a continuous catgut suture. In the case of an omental graft, a piece of omentum about two inches wide is entirely cut away of sufficient length to wrap easily round the bowel; this then being washed in a weak solution of carbolic acid is fastened round the seat of operation in the same manner as the flap, the cut omentum being united by a continous catgut suture. Dr. Weir, of New York, suggests that a peritoneal graft might be formed out of the mesentery which has been cut away.

In the seven cases in which this operation was performed the first two died from peritonitis due to leakage at the mesenteric attachment three days after the operation. In one of these the distal portion of intestine was invaginated into the proximal by accident. The third case died on the fourteenth day. In this case an omental flap was applied; at the post-mortem examination union of the gut was found to be perfect, as also of the omental flap, but the upper end of the bowel was filled with small pieces of hay mixed with other food, which the animal had

eaten. This had formed a complete block. The india-rubber ring had disappeared, and on removal of the accumulation, the lumen of the gut was found to be perfect. The remaining four cases all recovered, although in the last one, in which the omental graft had been applied, the dog wasted considerably, and when killed two months after the operation it was discovered that the portion of the bowel above the seat of operation in this dog was also enormously distended and filled with pieces of hay and *débris*.

Mr. Jessett states that this operation is much more difficult in dogs than in human beings, and that he has performed it a number of times on the dead body with perfect ease, and in one case, that of removal of a sarcomatous ovary in which a large portion of small intestine was involved, he was obliged to remove some twelve inches of intestine by means of this operation. The patient did well for eight days, when she suddenly developed peritonitis, and died on the tenth day. In this case there had been ulceration along one of the sutures, which, in the author's opinion, teaches the desirability of using plain, not chromicized catgut sutures for stitching the ring to the margin of the bowel.

The operation of *ileo-colostomy* may be accomplished either by approximation plates, the same as described for jejuno-ileostomy, or by the following method:

The ileum being divided a short distance from its junction with the cæcum, and all bleeding points ligatured, the divided end of the lower portion of bowel is invaginated into itself and secured by a continuous catgut suture passing through the serous and muscular coats only. The upper portion, being held by an assistant or secured by an india-rubber ring or clamp to prevent the escape of its contents, is lined with a thin india-rubber ring and two long sutures armed at each end with a needle passed in a similar manner to that described for circular enterorrhaphy. Next a slit an inch in length, or sufficiently long to allow the portion of intestine to be implanted, is made on the convex surfaces of the ascending colon. The needles of the sutures connected with the small bowel are next passed through the perineal and muscular coats of the colon at either end of the opening and the small bowel inserted into the slit; the two sutures are next firmly tied to prevent the bowel slipping out, and it is as well to introduce two lateral Czerny-Lembert sutures, one on each side, between the small [illegible] and colon. The operation, which is now completed, can be very quickly accomplished.

This operation was performed three times by the author, all making excellent recoveries.

Mr. Jessett then proceeds to analyze the operations as performed by Dr. Senn, and compare them with his own experience.

Gastro-Enterostomy.—Dr. Senn has reported five cases in which he performed the operation of gastro-enterostomy by means of decalcified bone plates. Three of these recovered without any bad symptoms and one died, the cause of death being attributed to the dog's stomach being full at the time of the operation. The omentum became soiled, and much of it was cut away. At the post-mortem one of the ligatures was found to have slipped, and hemorrhage ensued. In two cases operated on by Mr. V. Horsley and the author both recovered without bad symptoms.

In no case was any injury caused to the mucous membrane by the pressure of the plates.

In the second case, the jejunum was fastened to the posterior wall of the stomach by tearing through the gastro-colic omentum and transverse meso-colon, and drawing a portion of the jejunum through the meso-colic opening.

In the operation of jejuno-ileostomy performed by Dr. Senn, in seven cases the divided intestine was united by Czerny-Lembert sutures; five of the dogs died, three directly from the operation, and two from obstructions caused by enteroliths; the remaining two made good recoveries. Senn then operated on eight dogs by means of approximation plates; of these, seven recovered, and one died fourteen days after the operation, from the obstruction caused by the presence of an enterolith, the result of the dog eating his bed.

The five dogs operated on by Mr. V. Horsley and the author by means of approximation plates all recovered; and the one case in which the operation was performed by means of implantation of the upper segments into the lower, the dog died from hemorrhage due to the slipping of one of the ligatures on the third day.

These cases are very significant and instructive, for here we have fifteen cases operated on by Dr. Senn, exactly under the same circumstances, and, presumably, by the same operator, in seven of which the divided intestines were united by suturing the two en[illegible]

together by means of Czerny-Lembert sutures, and in the remaining eight the ends were united by approximation plates. Of the dogs operated on by the former method, five died, while in all of those operated on by means of the approximation plates, only one died, and that not directly from the operation, and this experience is fully confirmed by Mr. V. Horsley and Mr. Jessett, as in five cases operated on by them in which the ends of the intestines were united by approximation plates all recovered. Taking, then, into consideration the excessively low mortality of this operation when performed by approximation plates, the very short time the operation takes to perform,—namely, only about twenty minutes,—and comparing it with the results of the same operation carried out by suturing after Czerny-Lembert's method, which operation cannot be done under an hour and a half to two hours, there cannot be any question as to the value of the operation as proposed by Senn.

Enterorrhaphy by invagination is undoubtedly more difficult to perform than the operation by means of approximation plates, and the mortality after the operation is certainly larger. It will be noticed, however, by the report of cases performed by Mr. V. Horsley and Mr. Jessett, that the two factors play an important part in the success of the operation,—viz., first, practice; for out of the seven cases that were operated upon, it was the first two which died immediately from the effects of the operation; the third died from the bowel above the seat of operation being blocked by an accumulation of hay and *débris*, while the remaining four all recovered. The second factor is undoubtedly the use of the omental flap or graft, wrapped around the seat of operation.

Another point in this operation, as experience has taught, is that in all future cases on the human subject, the author would advise the use of ordinary catgut sutures for fastening the india-rubber ring to the end of the bowel, and also for passing through the coats of the intestines; and, finally, that three Chinese silk Czerny-Lembert sutures should be inserted to unite the two ends of the divided bowel, one on each side of the mesentery, and one in the convex surface of the intestine, to prevent the possibility of the bowel becoming disinvaginated.

The use of ordinary catgut sutures would prevent the possibility of the india-rubber ring being retained too long, and thus becoming a source of obstruction, and yet they would last a sufficiently long time to allow of plastic lymph being thrown out between the two approximated serous surfaces.

The author further points out that in all cases of obstruction there would be considerable difficulty in performing enterorrhaphy by invagination, as in such cases the proximal end of the bowel is of necessity greatly dilated, while the portion of the bowel below the obstruction is correspondingly contracted, so that the difficulty of invaginating the dilated into the contracted portion would be very great. This objection would not apply to union by means of approximation plates.

It will be seen, then, that in the nine operations reported by Dr. Senn, four were performed without an omental flap, three of which died. It is right to point out, however, that only one died directly from the operation, the other two dying one from the pressure of an enterolith eighty-one days after the operation, and the other from a faulty operation, the lower end of gut being invaginated into the upper by mistake. Of the remaining five operations, all had either an omental graft or flap; of these, only one died of perforation.

Of the seven operations performed by Mr. Horsley and Mr. Jessett, the two first died directly from the operation, the first from the lower portion of bowel being invaginated into the upper by mistake, and the third succumbed to obstruction caused by an enterolith, the result of the dog eating his bed, the remaining four making excellent recoveries.

Ileo-Colostomy.—Of this operation, Dr. Senn has reported sixteen cases, six of which were performed by implantation, the end of the ileum being lined with india-rubber band; of these, two died, one of septic peritonitis and the other of perforation; in seven dogs the operation was performed by lateral approximation, the two portions of gut being united by Czerny-Lembert sutures; of these, two died of septic peritonitis; in the remaining three the union of the ileum and colon was accomplished by means of approximation disks; of these, one died of peritonitis.

Mr. Victor Horsley and Mr. Jessett performed this operation in three cases, adopting in each case the method by implantation. All three cases made a perfect and speedy recovery; one dog was not killed until twenty weeks after the operation. The dogs always had perfect health, and got very fat.

There only remains, then, one more question to consider, and that is, in operating

on the intestine, how much of the small intestine may be removed without appreciably interfering with the nourishment of the subject operated on. Dr. Senn has operated on seven cases, removing from twelve to ninety-six inches of intestine. Three of these died immediately from the result of the operation; one died twenty-one days after the operation from marasmus (in this case thirty-four inches of bowel were removed); and in the three that were killed, marasmus is reported to have been extreme.

The result being that, in seven cases, two died from the operation, two died from marasmus caused by the operation, and three were killed at different dates, all suffering from extreme marasmus.

To sum up the result of the different operations above described it will be found to be as follows, namely:

Gastro-enterostomy by approximation plates: 6 cases, 1 death, death-rate equals 16.6 per cent.

Jejuno-ileostomy by approximation plates: 13 cases, 1 death, death-rate equals 7.69 per cent.

Jejuno-ileostomy by Czerny-Lembert sutures: 7 cases, 5 deaths, death-rate equals 71.5 per cent.

Enterorrhaphy by invagination without omental flaps: 4 cases, 3 deaths, death-rate equals 75 per cent.; with omental flaps: 12 cases, 3 deaths, death-rate equals 24.99 per cent.

Ileo-colostomy by implantation: 9 cases, 2 deaths, death-rate equals 22.2 per cent.

Lateral apposition by Czerny-Lembert sutures: 7 cases, 2 deaths, death-rate equals 28 per cent.; by apposition with approximation plates: 3 cases, 1 death, death-rate equals 33 per cent.

And again, by omitting the cases in which the Czerny-Lembert suture was adopted, we have forty-seven cases operated on either by approximation disks or invagination, with eleven deaths, or at the rate of 23.4 per cent.

Now, let us for one moment compare these results with those cases which are published, and with statistics collected of similar operations performed on the human being. The largest number of cases have been collected by Reichel, who, in the *Deutsche Zeitschrift für Chirurgie*, 1883, p. 230, furnishes the result of one hundred and twenty-one cases of resection of the bowel in which the ends were united by Czerny-Lembert sutures; of these, sixty-eight recovered, fifty-eight died, and five recovered with fæcal fistulæ, the death-rate being at the rate of forty-eight per cent. Ill has reported forty-seven cases, with twenty-five deaths, being at the rate of 53.1 per cent., while Weir, of New York, has furnished statistics of thirty-three completed cases of resection of cancerous intestine, with a mortality of 51.5 per cent.

Sir W. MacCormac, in his oration delivered at the Medical Society in May, 1887, on "Abdominal Section," gives particulars of thirteen cases of abdominal section performed for supposed traumatic rupture of the intestines and other abdominal viscera; all these cases died, some from injury to other viscera besides the bowel, some from shock.

Dr. B. Farquhar Curtis, of New York, in a paper read to the New York Medical Society at Albany in February of last year, in connection with a discussion on acute intestinal obstruction, has arranged a table of three hundred and eight cases to show the result of the various methods of treatment adopted by the surgeon, or forced upon him by the exigencies of the case with especial reference to this factor. From a study of this table, it will be seen that the obstruction was removed and an artificial anus formed in fifteen cases, with a mortality of ten, or at the rate of 66.6 per cent. In forty-five cases the portion of intestine was resected and the ends sutured; thirty-nine of these cases died, showing a mortality of 86.6 per cent. The obstruction in these sixty cases was caused by either intussusception, volvulus, adhesion, bands, or internal incarceration in forty-two instances. Dr. Curtis, in referring to the forty-five cases in which an attempt was made to suture the wound in the intestines whether it involved the entire circumference of the wound or not, says that the mortality reached the extreme point of 86.6 per cent.; only ten per cent. of the deaths were from sepsis due to the operation, while more than the usual number—fifty per cent.—were due to the condition of the patient, and twenty-three per cent. were due to the duration of the operation and to shock.

This is surely a strong argument for making the operation occupy as short a time as possible, and Mr. Jessett believes that the methods which he has described are those which will in the future, by enabling the surgeon to perform these operations in a quarter or a third of the time occupied by the system at present practised, be the means of saving many valuable lives, and will reduce

the mortality to that which is now obtained in ovariotomy and hysterectomy. In most extreme cases many surgeons are contented to perform enterostomy and creating a fæcal fistula or artificial anus. But by performing one of the several operations described of ileo-colostomy, jejuno-ileostomy, or enterorrhaphy, any one of which can be accomplished in quite as short a time as that required for the formation of an artificial anus, the surgeon performs a radical operation in the place of a palliative one, and the risk to the patient is not so great, for in the cases in which an artificial anus was formed, reported by Dr. Curtis, the mortality amounted to 66.6 per cent., and then the patient was left either with a permanent fæcal fistula, or would have at some future time to submit to a further operation for its closure.

Now, if we compare the mortality as shown by these statistics with that obtained by Senn's operation as performed by him and confirmed by Mr. Jessett, it will be seen that, excepting the seven cases of jejuno-ileostomy performed by Senn by the Lembert suture, forty-eight operations were performed, with twelve deaths, or a mortality of twenty-five per cent.; but, again, if one omits the fourteen cases in which the operation was performed, but afterwards abandoned for a safer one, the mortality is reduced to 17.6 per cent.

If, then, these figures can be accepted as correct, the mortality from these operations should be reduced from 86.6 to twenty per cent., by adopting the method of operating described, and by further experience and practice the death-rate will be reduced very much lower. But it will be argued that these figures are all very well, and we are willing to accept them for what they are worth, but it must not be overlooked that in all the cases recorded, and in which are claimed such brilliant results, the operations were performed on healthy animals, and the analogy between such operations and similar ones performed on a human being exhausted by disease or pain cannot for one moment hold good! True, but Senn has performed the operation of enterorrhaphy by the Czerny-Lembert system on seven healthy animals, five of which died, giving a mortality of 71.5 per cent., or a death-rate within a fraction of what the same operation is credited with on the human subject.

Again, can it for one moment be doubted if two surfaces of peritoneum can be brought into sufficiently close apposition by the operation advocated, it cannot make any difference in this respect whether the patient be in health or wasted by disease, and further if these operations can be done in twenty to thirty minutes instead of an hour and a half to two hours, does it not follow that the chances of success must be enormously increased?

We now, then, arrive at the third point for our consideration,—namely, *in what form of obstruction of the intestinal tract are these operations applicable?* Mr. Jessett holds that there is no form of obstruction which cannot be relieved by ordinary manipulation, in which either one or the other of these operations may not be practised with every hope of success.

Gastro-Enterostomy.—This operation may be practised for an obstruction arising at either the pylorus, the duodenum, or upper part of the jejunum. The principal form of obstruction in which this operation is to be recommended is undoubtedly malignant disease or stricture of the pylorus. In both these forms of disease the patients, as a rule, are much emaciated and exhausted before they apply for relief; it is then of all importance that any operation should be conducted so as to cause as little shock as possible, and in this case such an end can only be attained by shortening the duration of the operation to its minimum; and this can be attained by the operation already described,—namely, by uniting the stomach and jejunum by approximation plates. The same may be also said with regard to the operation when required for obstruction arising in the duodenum.

It is true that in some forms of fibrous stricture of the pylorus Loreta's operation of opening the stomach and forcibly dilating the stricture has been practised apparently with success, but this operation is quite as formidable as that of gastro-enterostomy as practised with approximation disks, and the permanent nature of the relief cannot be so reliable by the former operation as by the latter.

Jejuno-Ileostomy and Enterorrhaphy by Invagination.—These are operations both of which are applicable to cases of obstruction which necessitate the excision of a portion of small intestine either for gangrene of the gut, direct strangulation (for example, hernia, volvulus), fæcal fistula, or contraction of some portion of the intestine due either to simple stricture or an epitheliomatous growth. Until quite lately, in nearly all such cases, the surgeon has been contented to remove the diseased portion of bowel and establish a fæcal fistula, waiting until a future

day for the performance of enterorrhaphy by means of Czerny-Lembert sutures, thus exposing the patient to the risk of two operations; and each operation is attended with an extremely high mortality.

Of late years, however, surgeons have in several cases excised the diseased portion of intestine, and if circumstances allowed, at once sutured the two ends together either by the Lembert method or Jobert's, or some one of the other numerous plans that have been devised for this purpose by different surgeons.

From the success attained by Professor Senn and the author in investigation, Mr. Jessett ventures to think that there is no case, when enterostomy is performed, in which the continuity of the bowel may not be restored at once, with every chance of success, by adopting one of the operations he is now advocating,—namely, either by approximation of the two surfaces of the intestine, after their ends have been invaginated into themselves, by approximation disks, or by enterorrhaphy,—by invagination of the upper into the lower segment of bowel, after the plan already laid down. Further, in very few cases is the surgeon justified in forming a fæcal fistula.

With respect to the choice of these two operations in special cases, that of re-establishing the continuity of the bowel by means of lateral apposition and approximation disks commends itself mostly, for in all cases of obstruction of the intestine which has lasted for any time the upper portion will be always found to be much dilated, and that portion below the stricture contracted so that it would be most difficult, and, in many cases, impossible, to invaginate the upper into the lower, whereas the approximation of the convex surfaces of the two ends would be comparatively easy to accomplish.

Again, in cases in which the obstruction is the result of adhesion or matting together of the intestine, which adhesion cannot be broken down without injury to the coats of the bowel, there would usually be no difficulty in adjusting the portion of the intestine above the seat of obstruction in apposition with that below, and securing by means of approximation plates, without the necessity of excising the portion of intestine so bound down or matted together, thus materially diminishing the risk to the patient.

Again, it has been shown that the mortality after this operation is very much less,—namely, only at the rate of 7.69 per cent., as inst 24.99 per cent. after invagination. This surely, then, must be a convincing proof of the superiority of the one over the other operation.

And, lastly, from the rapidity with which this operation can be performed, occupying, as it does, considerably less time than would be taken in stitching the open ends of the divided intestine to the abdominal walls to establish a fæcal fistula, it must in the future occupy the most prominent position in all operations for the relief of intestinal obstruction of the small intestine.

Ileo-Colostomy.—This is, perhaps, the most interesting of all the operations described, and it is likely to play a very important part in future surgery for the relief of irreducible intussusception of the ileum into the cæcum and malignant disease of the colon.

Hitherto the only operative means for relief in such cases, if resection be not performed, supposing the abdomen to be opened and, in the one case, the invagination found to be irreducible, or, in the other, the growth such as cannot be removed, has been enterostomy, and the establishing of an artificial anus; but this operation, performed under these circumstances, has been found to offer less chance of recovery than enterostomy for simple stricture of the smaller intestine. As Treves has pointed out (referring to this operation for relief of intussusception), "not only is the obstruction relieved, but a portion of gut is left in the abdominal cavity that may cause fatal mischief. The unreduced intussusception may, in spite of the artificial anus above it, become gangrenous, or its walls may ulcerate, or the inflammation existing in its tissues may lead to fatal peritonitis. It is only by an excision of the involved segment that these evils can be obviated." In thirteen cases of enterostomy, or enterectomy, for intussusception, collected by Mr. McArdle, Dublin, ten died, four from gangrene, three from septic peritonitis, and two from exhaustion.

Now, by performing ileo-colostomy by implantation, these difficulties may be overcome, the continuity of the bowel be re-established, and a fæcal fistula avoided. Moreover, in many cases it would not be difficult to remove, through the opening in the colon, the invaginated portion of small intestine.

As we have seen, the mortality of this operation is exceedingly small. Ileo-colostomy might be had recourse to also in all cases where colectomy has to be performed, as it is equally easy to implant a portion of small intestine into the sigmoid flexure, or, indeed,

into the rectum, as it is to implant it into the ascending colon.

Finally, the conclusions to be drawn from what has been said are obvious, namely:

1. Gastro-enterostomy, jejuno-ileostomy, and ileo-colostomy should always be performed by lateral apposition, by approximation decalcified bone plates.

2. But when enterorrhaphy is performed, it should always be by invagination of the upper into the lower portion of the gut, and that continuity of the peritoneal surfaces of the ends of the bowel to be united should be procured, where the mesentery is detached by stitching the peritoneum together over the denuded surface of intestine with fine catgut sutures before the bowel is invaginated.

3. In cases of complete division of the bowel, circular enterorrhaphy is not to be recommended, but the ends of the divided bowel should be closed by invagination, and the continuity of the canal established by means of lateral apposition and approximation disks.

4. That a fistulous opening should be established between the bowel above and below the seat of obstruction by lateral apposition and approximation disks in all cases where it is deemed inadvisable to remove the obstructed portion of the intestine.

5. That an artificial anus should never be formed unless it is found to be absolutely impracticable to re-establish the continuity of the intestinal canal by one of the operations named.

6. That ileo-colostomy, or ileo-rectostomy, either by means of approximation disks or implantation, should always be performed in cases of ileo-cæcal invagination, which cannot be reduced by gentle traction, or malignant diseases of the colon.

7. That omental grafts some two inches wide, or omental flaps, should be adopted in all cases of circular enterorrhaphy, as experience shows these grafts retain their vitality, and become adherent in a few hours.

THE THERAPEUTIC ACTION OF SENNA-PODS.

In the *Lancet* for July 27, 1889, DR. A. W. MACFARLANE said that although he had for several years discarded the use of senna in most of its forms, at the suggestion of Dr. Thomas Keith he tested the utility of the senna-pods as a laxative in various cases of obstinate constipation. As it was early apparent that their properties differed vastly from those of senna-leaves, he made a number of investigations to ascertain wherein the disparity of their action lay.

In the first place, it is well known that an infusion of senna-leaves has a characteristic and nauseous taste and odor; that it acts as a mild acrid or drastic purgative, exciting increased peristaltic movements in the small intestines, which, hurrying the contents quickly through the colon and rectum, cause the evacuation of watery stools in four or five hours; inducing concurrently, in many instances, hyperæmia of the pelvic blood-vessels, which excites or aggravates hemorrhoidal and menstrual losses. Its administration is so commonly attended by griping, tenesmus, and flatulence, that it is seldom prescribed except in conjunction with a carminative, these disagreeable symptoms being more marked if the leaves are long infused, to obviate which the time fixed for the preparation of the infusion in the British Pharmacopœia is half an hour. In nursing women the active principles of senna-leaves are partially excreted through the milk, giving rise to griping and purging in the infant. On account of the irritating effects, the infusion of senna has long been discarded in cases in which there is any tendency to congestion of the gastro-intestinal canal, to miscarriage, and to hemorrhoids, etc.; and, in consequence of its drastic and depressing properties, it has been deemed an unsuitable remedy in neurasthenic conditions.

The products of the senna plant, as imported into this country, consist of leaves, stalks, pods, and flowers, with certain other extraneous materials; these are sent to the great prisons to be picked, and the leaves are carefully selected and returned to the druggists, while the other parts are rejected. Senna-pods have been so little used in Great Britain that no reference is made to their medicinal properties in any of the text-books on materia medica or therapeutics. They are thus described by the late Dr. Scoresby-Jackson in his "Note-Book on Materia Medica:" "Legumes, pendulous, flat, slightly enlarged over the seeds, upper margins a little curved, brown, containing from five to eight seeds." The only references to their therapeutical employment are as follows: 1. By Dr. James, in the "New Universal English Dispensatory," second edition, 1752, page 252: "The follicules or fruit of the sena (*sic*) tree purge in a less degree than the leaves." 2. By Dr. Pereira, in

his work on the "Elements of Materia Medica and Therapeutics," third edition, 1853, vol. ii., part 2, page 1870: "The legumes are much milder in their operation than the leaflets." 3. By F. A. Flückiger and D. Hanbury, in the "Pharmacographia," 1874, page 191: "The Arabian and the mediæval physicians of Europe used both the pods and the leaves, preferring, however, the former. . . . The pods (folliculi sennæ) are still employed in some countries." It is thus apparent that the dissimilarity of action which exists in the leaves and pods was long ago appreciated.

An infusion of senna-pods is almost free from taste and smell; certainly it is devoid of the characteristic odor and flavor of "senna." It appears to increase activity in the muscular movements of the whole gastro-intestinal canal, acting quite as much on the colon and rectum as upon the small intestine. It is slower in its action than an infusion of the leaves, but equally certain; an ordinary dose produces without fail one motion, seldom more, of soft consistence, in from eight to ten hours, and without exciting any congestion of the pelvic vessels, or increasing or aggravating hemorrhoidal or menstrual discharges. It is, in short, a reliable evacuant, free from irritating properties such as cause griping and flatulence; and, if the experience of one case is worthy of mention, it does not appear to be excreted through the milk in the nursing mother, for in one such patient the child was unaffected by its use. Administered regularly for several nights in cases of intestinal torpor, it cleans the tongue, increases the appetite and digestion, and promotes natural evacuation of the bowels, so that the quantity taken requires to be decreased, and eventually it can be dispensed with. The cases in which Dr. Macfarlane has found it most serviceable are those depending upon impaired muscular movements, from defective innervation, usually associated with flatulence and intestinal discomfort. It has also proved useful in cases of hemorrhoids, and in constipation in children, as well as in the aged. Like all purgative medicines, the infusion acts better in some persons than in others, and also in the same person at different times; but, after a fairly extended experience of its use, the author says that in no case has he ever been disappointed in its utility, nor has he been annoyed by any untoward effects. Naturally it cannot be expected that it will meet the exigencies of every case of constipation, but it certainly seems a real addition to our remedies, even, according to the statement of Dr. Macfarlane, exceeding cascara sagrada in efficiency, while its freedom from disagreeable taste is a strong point in its favor.

The author claims that the pods are quite as harmless as castor oil, and that he knows of no condition which contraindicates their use. The dose for an adult is from 6 to 12 pods; for the young and very aged, from 3 to 6. They are best infused in a claret-glassful of cold water. Dr. Macfarlane has also prepared a plain and simple fluid extract of the pods, a dose being from ½ a drachm to a drachm in a wineglassful of cold water at bedtime. It has little taste and is certain in its action, while the preparation possesses the advantage of always being ready for use.

SPONDYLALGIA.

Dr. Max Buch describes in a preliminary communication to the *St. Petersburger Medicinische Wochenschrift* a nervous cardialgia, the pain in which he discovered to be strictly confined to the anterior surface of the vertebral column, and to be caused by pressure. The pain is so exclusively due to pressure upon the bone that in those of his forty cases in which it was referred to the epigastrium the result of pressure over this region was not merely absence of pain, but rather a feeling of comfort, while pressure on the vertebral column in the umbilical region caused not only local pain, but a neuralgia also, radiating into the epigastrium, and exactly corresponding with the spontaneous pain. Spondylalgia may, according to Dr. Buch, reach as far down as the sacral promontory; in which case, however, some parts of the vertebral column are usually more sensitive to pain than others, or special localities alone are sensitive to pressure. Spontaneous pain also may affect the whole column, and patients often complain during attacks of gastralgia of a pain affecting both sides of the sternum, extending to the clavicle, or over the middle of the chest and the lower half of the sternum. In most of these cases Dr. Buch succeeded in producing the same pain by exerting pressure on certain points of the abdominal part of the vertebral column. Spondylalgia is, indeed, like true neuralgia, apt to radiate from any point over which pressure is made towards some distant point-

the pain being not only local but also remote. Dr. Buch believes that he has made out a correspondence between certain points: pressure, for instance, about an inch above the umbilicus generally causes pain in the region of the sacro-iliac synchondrosis, or a little above the sacrum; pressure about an inch below the umbilicus causes pain, radiating into the epigastrium, and especially into the pit of the stomach. In one patient, a woman of 40, pressure in the umbilical region caused a pain like compression in the middle of the vertex, exactly similar to clavus hystericus. Pressure on the spinous process was rarely painful. Other symptoms of spondylalgia are malaise, eructations (often sour), ravenous appetite, or a feeling like that of hunger. The bowels are normal or a little constipated; diarrhœa is rare. In some cases painful pulsation of the abdominal aorta was observed. All the symptoms of spondylalgia most frequently denote general neurasthenia. They also occur in chlorosis and diseases of the uterus. The affection is, pathologically, a neuralgia of the vertebral plexus of the abdominal sympathetic, to which the name "spondylalgia" has been given by Dr. Buch as being short and graphic. His treatment consists in a subcutaneous injection of a fifty per cent. solution of antipyrin into the abdominal region, or, in cases of neuralgia, at the seat of pain. The injection is rather painful, and the puncture if left to itself remains so for many days. If, however, massage is practised immediately after the injection, first lightly and then with some amount of energy, to disperse the liquid, the sensitiveness disappears in about ten minutes. Dr. Buch used the antipyrin injection, according to circumstances, daily or every two or three days. A complete cure occasionally took place after one or two injections, but sometimes only after ten or more. Improvement was generally observed after the first injection. The original affection must, of course, never be neglected, and in chlorosis the spondylalgia has been known to disappear under the administration of iron. He mentions, as particularly interesting from the therapeutic point of view, cases in which the spondylalgia disappeared under long-continued palpation, so that massage of the abdomen may in some cases be an excellent method of treatment. In conclusion, the author states it as his opinion that the affection is very common, and that every case of cardialgia and dyspepsia ought to be examined for traces of it.—*Lancet*, August 10, 1889.

LOCAL TREATMENT OF CHRONIC ENDOMETRITIS.

According to the Paris correspondent of the *Medical Press* (July 31, 1889) M. Pollailon has just laid before the Académie de Médecine a suggestion as to the treatment of chronic endometritis by chloride of zinc pencils. A cardinal point, the learned member contends, is the finding the proper dimensions to give to the substance, not so much as regards its length as its thickness, which should not exceed a quarter of an inch in any case. The action of the chloride of zinc is rapid, and from the fourth to the twelfth day the eschar comes away, and the *suites* of the operation are always very favorable. The pain is slight, and no febrile reaction is observed. To avoid any complication, the patients are ordered to keep to their bed three days, and lie on the sofa five or six days, or until the slough becomes detached. At the end of three weeks, a complete cure is generally obtained. Out of forty cases, those treated by M. Pollailon, thirty-eight were cured. The menses are not interfered with by the caustic. As to the indications and counterindications, all chronic endometritis with purulent secretions, all infectious or hemorrhagic endometritis, and even all uterine hemorrhages, except those provoked by confinements or large tumors, are benefited by this treatment. However, in the case of young women, this cauterization should be used with care. It was said that it caused sterility, but every young woman affected with chronic endometritis is sterile, and remains so unless treated. Acute metritis and ovaritis would be counterindications to the employment of chloride of zinc.

A NEW TREATMENT FOR TINEA TONSURANS.

A new mode of treatment proposed by M. Vidal has for its object the destruction of the trichophite by microbicides, and the prevention of its reproduction by depriving it of oxygen, for, as is well known, this is an aërobic organism.

M. Vidal fulfils these two indications, *first*, by the employment of spirit of turpentine as a parasiticide; and, *second*, the covering of the affected part with caoutchouc. The following is the technique of his method of treatment (*Gazette Hebdomadaire de Médecine et de Chirurgie*, July 26, 1889):

First.—The application of lotions of spirit

of, turpentine to the scalp without previous epilation.

Second.—Friction with tincture of iodine, which should at each sitting only be applied to a limited surface of the head. This should be repeated two or three times for each spot, until it has been applied to the whole scalp.

Third.—Daily inunction of the scalp at intervals with vaseline.

Fourth.—Covering the head with a rubber cap, which should fit as closely as possible to the surface of the head.

It is claimed that by this method epilation is avoided and the duration of the treatment is greatly shortened.

THE TREATMENT OF PULMONARY TUBERCULOSIS BY HOT AIR.

Among recent methods of treatment is that of Worms and Krull, of inhalations of hot or cold air. The tubercle-bacillus being able to flourish only between restricted limits of temperature, the idea naturally occurs that its development may be prevented by raising or lowering the temperature of the inspired air above or below those limits. Worms recommends cold air; Krull has tried inhalations of hot air. PROFESSOR DE RENZI also prefers the second, chiefly because the required temperature is more easily obtained with inhalations of hot air. The hot air is obtained from a strongly-heated spiral tube; before reaching the mouth of the patient it passes through a tube in which is placed a thermometer indicating exactly the temperature of the air inhaled. A special metallic mask is used for the face, and a layer of cotton is placed between the mask and the skin. He has treated eight patients in advanced phthisis in this manner; three were distinctly benefited. The inspired air, to exert a marked effect, must be very hot; no effect is obtained with inhalations of air at the temperature of 43° or 46° C., such as Krull uses. This is not sufficient to modify sensibly the state of the tissues infected by the tubercle-bacillus. Air heated to between 80° and 160° C. is very well borne by the patients. The mask becomes hot and burns the skin, but if this is avoided by carefully padding, air at the temperature indicated is tolerated without difficulty. In one patient inhalations at 180° C. caused no discomfort. The temperature he recommends as most convenient and best borne is from 140° to 160° C. The duration of each inhalation is from fifteen minutes to one hour. One patient had hæmoptysis during treatment, but he had often had it before. All the patients so treated felt better and stronger, and wished to continue the treatment. In some the weight of the body increased, and the quantity of the bacilli in the sputa sensibly diminished. The pace of the heart and respiration is quickened by the inspiration of the hot air, and the general temperature of the body is raised, but all subside as soon as the inhalation is over.—*London Medical Recorder*, July 20, 1889.

SOME NEW DRUGS.

The following statements as to a number of new drugs are published in *Les Nouveaux Remèdes* for July 8, 1889:

Mutisia viciæfolia Cav.—This plant is a native of the Andes, and, according to DR. SAAC, its active principle is attributable to a bitter substance contained in the seeds. The Indians employ it in cardiac affections, epilepsy, and many other diseases, while Perreira is said to have obtained good results from it in hysteria. From the investigations of Dr. H. Rusby, it appears that this drug acts favorably in affection of the respiratory passages, but especially in the disturbance of cardiac action, which is so often consequent upon ascent of high altitudes. In these localities coca is employed as a prophylactic and stimulant, while mutisia is used whenever there is any feebleness of the heart. Thirty-six different species of mutisia have been discovered.

Geronia speciosa, one of the Bigoniaceæ, is indigenous to South America, where the natives call it *ipeuva* or *cinco*. According to J. ZEHNDER this drug is employed as a diuretic, and as a local application in syphilis and rheumatism. It is probable that the drug contains alkaloids, but they have not yet been isolated.

Aerocomia sclerocarpa Mart. is likewise found in South America. Its flowers have an odor which resembles that of oil of turpentine, and contain, besides traces of volatile oil, two per cent. of a brownish, yellowish resin which is soft, is soluble in ether and alcohol, has an odor resembling that of incense, and one per cent. of resinous acid, two per cent. of tannin and gallic acid. According to PECKOLT, these flowers possess great popular favor as a remedy in leucorrhœa, and as a gentle astringent in diarrhœa, hemorrhages, and albuminuria.

METHACETIN.

A few months since reference was made in these columns to a compound that had been reported upon favorably as an antipyretic and antineuralgic, and which from its analogy to phenacetin had been named "methacetin." The relation of these compounds to each other is easily apparent on comparison of the formula by which they are represented, from which it appears that methacetin differs from phenacetin in containing a methyl group in the place of an ethyl group:

$C_6H_4\begin{cases}O.C_2H_5(1)\\NH.C_2H_3O(4)\end{cases}$ Phenacetin. $C_6H_4\begin{cases}O.CH_3(1)\\NH.C_2H_3O(4)\end{cases}$ Methacetin.

If the comparison be extended to antifebrin, it may be stated that antifebrin is acetanilide, phenacetin is oxyethylacetanilide, and methacetin is oxymethylacetanilide. Methacetin is now stated (*Pharm. Zeit.*, July 10, p. 419) to crystallize in shining white, odorless, and almost tasteless scales, melting at 127° C., and boiling undecomposed above that temperature. It is soluble in 526 parts of water at 15° and 12 parts at 100°, while phenacetin requires 2500 parts of water at 15° and 86 parts of water at 100°; it follows, therefore, that the solubility of methacetin in water is five times as great as that of phenacetin. In alcohol and acetone methacetin dissolves very freely, and also in chloroform, especially when warmed. It is less soluble in benzol, and only difficultly soluble in carbon bisulphide, petroleum, benzine, and ether. Upon cooling or evaporation of a solution, the methacetin separates unaltered in handsome crystals. It is also freely soluble in glycerin and fixed oils, especially when heated, and with more difficulty in turpentine and other essential oils. An aqueous solution is neutral in reaction, and should not be affected by barium chloride, silver solution, or ammonium sulphide. Heated on platinum foil, it should burn without leaving any residue. In most of its known chemical reactions it resembles phenacetin, from which it is best distinguished by its physical properties. For instance, if methacetin be heated with insufficient water for its solution, it melts and solidifies again upon cooling, but phenacetin heated with the same quantity of water does not melt. In respect of the therapeutic value of methacetin, DR. WELLER corroborates what has been previously stated, and says that in its action it corresponds in every respect with phenacetin.—*Pharmaceutical Journal and Transactions*, July 27, 1889.

FAVORABLE ACTION OF PILOCARPINE IN DYSTOCIA ON ACCOUNT OF ANASARCA.

DR. CIRERA reports in a recent number of the *Gaceta Med. Catalana* (*Deutsche Med. Zeitung*, July 25, 1889), the case of a primipara, 18 years of age, who in the fifth month of pregnancy commenced to suffer from œdema of the feet, which gradually extended until finally there was complete anasarca with scanty urination. According to the report labor had apparently lasted for three days before the writer was called, when he found that the uterine contractions had entirely ceased, though the child was still living.

The presentation was of the vertex, while the os was dilated to about the size of a silver dollar. Dr. Cirera made a subcutaneous injection of ⅓ grain of muriate of pilocarpine, which was shortly followed by the return of the uterine contraction, accompanied by the physiological action of the drug, and terminated in a few hours in the natural birth of the child. The subsequent progress of the case was entirely normal.

From this observation the author concludes that, in addition to its power of producing secretion of sweat, pilocarpine also is a stimulant of the uterine muscular tissue; even although it possesses in pregnant animals no stimulating power in the uterus, he claims that when the labor pains are present the use of pilocarpine will intensify them if feeble, or if they have disappeared will cause their reappearance.

THE TREATMENT OF CONSTIPATION IN CHILDREN.

In the *Lyon Medical* for August 4, 1889, DR. ELOY publishes the following formulæ for the treatment of constipation in children:

1. *Constipation in the New-Born.*—Monti and Widerhofer prefer mannite to manna in the treatment of constipation in new-born infants. Dissolving 5 to 10 parts of crystallized mannite in 50 to 100 parts of water, 1 teaspoonful of this solution being given every two hours.

Another preparation in great favor in Austria has the following composition: Powdered rhubarb-root, 45 to 75 grains; carbonate of magnesia, 45 to 75 grains; oil of fennel or anise, 80 drops. A pinch of this powder may be given three times daily.

2. *Constipation in Children from 2 to 4 Years of Age.*—For children of this age, either the purgative mineral waters may be prescribed,

or the following purgative syrup may be administered in Seltzer water: Citrate of magnesium, 1 ounce; lemon or other fruit syrup, 10 drachms; distilled water, 2 ounces.

Children will also readily take castor oil when mixed with equal parts of syrup of orgeat; one or two teaspoonfuls will suffice.

TYPHOID FEVER IN DOGS.

The greater part of the difficulty which has attended all attempts to determine the microbic nature of typhoid fever has been explained as attributable to the fact that the disease is not communicable to dogs. We have recently published an account of the researches of Dr. Vaughan in this connection, but it would appear from the paper published by Dr. J. B. Roberts, in the *Indian Medical Gazette* for June, 1889, that dogs do not enjoy the immunity from typhoid fever which is generally admitted. While stationed at Sialkot during the last cold weather, Dr. Roberts was led, by the occurrence of a heavy mortality among dogs of European breeds, to make a series of post-mortem examinations. In a certain proportion of cases he found the following coincident lesions: 1, an enlarged, dark-colored, friable spleen; 2, swollen, inflamed mesenteric glands; 3, large oval ulcers in the ileum; 4, swollen oval patches; 5, points of submucous hemorrhages; 6, large intestine with submucous hemorrhages along the crests of the longitudinal rugæ seen in the dog; 7, inflamed vermiform appendix. The animals presenting these lesions had suffered during their illness from continued indisposition, increasing debility, distaste for food, vomiting, and stools, which, if passed by a human patient, would be at once pronounced typhoid, though this was by no means invariable, as constipation might be present. The temperature might be high (in one case it was 104.5°), but temperature in dogs, though normally about 100°, can easily be raised to 103° or higher by exercise.

In commenting on this observation of Dr. Roberts, the *British Medical Journal* for August 3, 1889, calls attention to the fact, that about four years ago Mr. Bland Sutton communicated to the Pathological Society of London a paper on the occurrence of a disease in monkeys and in beavers, which he identified with the typhoid fever of man; he also observed the lesions in a tiger in a solitary case. The only symptoms observed during life were diarrhœa and hemorrhage, but it was not possible to make careful clinical observations. He pointed out that M. Serres had recorded the occurrence of typhoid fever in monkeys, dogs, and cats, and had made some extended observations during an epidemic which occurred among the monkeys in the Musée d'Histoire Naturelle, in Paris; the symptoms observed were diarrhœa, increased frequency of pulse, and fever, ending almost always in death. Dr. Roberts suggests that if further examination should prove that dogs, as he suspects, are liable to typhoid fever, that fact would help to explain the continued prevalence of the disease in Indian cantonments, in spite of the sanitary precautions taken.

THE LOCAL TREATMENT OF ERYSIPELAS.

It is now tolerably well recognized that the destructive fever in erysipelas can only be arrested through the prevention of the spread of the local process, and unless this be accomplished all antipyretics will fail in arresting the fever. For more than a decade numerous remedies have been employed with more or less success in the local treatment of erysipelas. In many cases marked success will be attained through the use of Professor Wölfer's so-called mechanical treatment of erysipelas.

In the *Wiener Medizinische Wochenschrift* for July 6, 1889, Dr. Berthold Hamburger writes that he has obtained most satisfactory results by a much simpler and more practical method, which he has employed for more than ten years. His plan consisted in painting with tincture of iodine around the margin of the erysipelatus spots a border about one or two inches broad, the application to be repeated at least twice daily as long as there is any tendency of the disease to spread. Dr. Hamburger claims that in this way the extension of the disease may be readily prevented, even when it occurs on the head. No complaint is made as to any irritation being produced by the constant use of the iodine tincture, a fact which is, however, explicable on the ground that not more than a few days at the most are required to arrest the spread of the affection. In a few cases the author states that in twenty-four hours the local process will be ameliorated, and will be accompanied by a corresponding falling of temperature. The author states that the skin must be tested by the touch in order to accurately determine

the limit of the disease. For extreme sensibility may be present considerably beyond the visible limits of the disease, and the iodine should be applied on the healthy skin beyond the limits of increased sensibility. Local application of oils and cold on the erysipelatous localities will prove most agreeable to the patient.

RENAL COMPLICATIONS IN WHOOPING-COUGH.

Some time ago Dr. Stefano Mircoli pointed out that he had several times observed renal complications in whooping-cough. Thus, on one occasion, among ten children suffering from the disease, nephritis occurred in two cases, one of which died. The necropsy left no doubt as to the existence of the renal affection. During another outbreak, among thirty-five cases, nephritis developed in four. Two of these died, and in one a post-mortem examination was made. The kidneys were examined microscopically, and were seen to be in a condition of severe parenchymatous nephritis. No micro-organisms could be seen. Recently Dr. Mircoli has brought forward additional evidence on the subject. In a recent epidemic at Monterubbiano, of twenty-four patients, three died, one from suppression of urine, another from suffocation in a paroxysm of coughing, and a third from marasmus. In the two latter cases, although during life there were no symptoms of renal affection, on post-mortem examination venous stasis in the kidneys with commencing albuminuria was found. There was also a considerable amount of hemorrhagic infiltration. Cultures of the kidney-tissues gave negative results. Dr. Mircoli believes that the renal affection is due to venous stasis caused by obstruction of the vena cava through the violent paroxysms of coughing. According to him, the kidney is affected, in whooping-cough, in twelve per cent. of cases occurring in children.—*London Medical Recorder*, July 20, 1889.

DIABETES MELLITUS AS A CONSEQUENCE OF EXTIRPATION OF THE PANCREAS.

J. von Mering and O. Minkowski have found that extirpation of the pancreas in dogs is followed by diabetes (*Medicinisch-Chirurgische Rundschau*, July 15, 1889). The diabetes begins a short time after the operation, and persists without interruption for weeks at a time up to the death of the animal. In addition to the appearance of sugar in the urine, polyuria, great thirst, hunger, and rapid emaciation occur in spite of abundant feeding. In one dog in which the authors removed the pancreas, and which had fasted forty-eight hours, the urine contained from five to six per cent. of sugar, while another dog, weighing sixteen pounds, fed on exclusive meat diet, eliminated daily almost one litre of urine, with six to eight per cent. of sugar. When grape-sugar was added to the diet the percentage of sugar in the urine amounted to thirteen per cent., the greater part of the sugar given being eliminated unchanged.

It is also worthy of mention, that in dogs subjected to this operation, the urine contains a considerable amount of acetone. It was also noticed that the percentage of sugar in the blood was greatly increased; in one case it amounted to .30 per cent., and another .46 per cent. No glycogen was found to be in any of the organs after death, even in animals on full meat diet, which had been diabetic for four weeks or more.

It is stated that there was no injury to the solar plexus in the operation, so the diabetes is to be regarded as a direct consequence of the extirpation of the pancreas.

Transfusion of blood from a diabetic dog into the veins of a healthy animal did not produce excretion of sugar in the latter. The authors' experiment also showed that in animals in whom the pancreas had been extirpated absorption of fat and assimilation of proteids was seriously interfered with.

PULSATILLA IN THE TREATMENT OF EPIDIDYMITIS.

Dr. Robert J. Carter states in the *Lancet* for August 3, 1889, that for some time past patients at the Male Lock Hospital with gonorrhœal epididymitis have been treated by the internal administration of pulsatilla. The drug was exhibited in the form of the tincture, the doses given varying from 5 to 30 minims every four hours. One patient only complained of nausea after taking the drug. In the case of patients taking the larger dose the pulse-rate was perceptibly lowered, although in one case in which observations were made no diminution of temperature took place. Without going into the details of the cases, a comparison with others treated by the usual methods shows that in no in-

stance was the duration of the pain and tenderness less than the average; and, in fact, in several cases treated by pulsatilla alone, without local applications, the pain lasted rather longer than usual. The severity of the inflammatory process, as evidenced by the amount of plastic exudation thrown out, does not appear to be influenced at all by this drug. In fact, cases treated by it pursued the same course as when treated by simple rest in bed, attention to the emunctories, etc.; and, according to the writer's experience of the drug, it is not even a useful adjunct to the treatment of epididymitis.

TREATMENT OF PSORIASIS WITH HYDROXYLAMINUM.

In an article upon the value of this new remedy in the treatment of psoriasis, DR. FABRY gives his experience after observing twenty-four cases thus treated in the service of Dr. Doutrelepont, of Bonn (*Archiv für Dermatologie und Syphilis*, Heft 2, 1889).

Hydroxylamin was first obtained by Lossen, in 1865, from the reduction of nitrous acid; it is one of the bodies allied to ammonia, NH_3 being ammonia and NH_2OH hydroxylamin, and, like ammonia, has the peculiarity of readily entering into combination with hydrochloric acid.

NH_3HCl = sal ammoniac.
$NH_2OH.HCl$ = hydroxylamin murlaticum.

The hydrochloric combination of hydroxylamin is characterized by its ready solubility in water, alcohol, and glycerin, and these combinations turn blue litmus-paper an intense red.

It is a narcotic, and produces paralysis of the nerve-centres, and in large doses produces convulsions and death. Experiments upon animals and upon blood outside of the body have shown that oxyhæmoglobin of the blood is transformed by hydroxylamin into methæmoglobin by abstraction of oxygen. This reduction property which it possesses is very energetic and rapid.

In treating psoriasis, the author employs either an alcoholic solution, such as:

℞ Hydroxylamin muriat., .2 to .5;
Spirit. vini, 100;
Calcar. carbon., q. s. ad neutr.
D.S.—Apply with brush.

Or a watery solution, applied as in a hydropathic band:

℞ Hydroxylamin muriat., 1;
Aquæ font., 1000;
Calcar. carbon., q. s. ad neutr.
D.S.—Apply as wet cloth.

As in other applications, the scales are to be first removed by bathing, rubbing with green soap, and applications of ten per cent. zinc salve. As this new substance has decided toxic properties, the 1 to 1000 or 1 to 500 neutralized solution is used in the beginning, and the stronger applications, up to one-half per cent., are gradually employed, being painted on the diseased areas twice daily. A cloth wet in the solution, or a Priessnitz band, can be applied every two hours to suitable parts. As is the case with pyrogallol, chrysarobin, and some other substances, albumen may appear in the urine as a consequence of absorption of the drug. So far as a radical cure of psoriasis is concerned, hydroxylamin promises no more than the substances now used as external applications, recurrences appearing to be quite as frequent as after older methods. The features of this new remedy which recommend it are its cheapness, the fact that it does not stain the clothing, and does not produce dermatitis of the healthy skin in the way chrysarobin and pyrogallol do, while being quite as active an agent in removing the lesions of psoriasis. So that the author does not hesitate to advise its use in this disease.

So far as the length of treatment required to remove the lesions is concerned, it appears that the action is not more rapid than that of chrysarobin, a four to six weeks' course being necessary. In the degree of effect produced, it does not fall behind that of other reduction agents now in use, but its effects upon the system must be watched. In some patients, so much pain from the stronger applications is complained of, that other means have to be substituted or the treatment intermitted.

Eichoff is reported to have had some good results with the remedy in lupus, herpes tonsurans, and parasitic sycosis.—*Journal of Cutaneous and Genito-Urinary Diseases*, August, 1889.

COPAIBA AS A SURGICAL DRESSING.

In the *Boston Medical and Surgical Journal* for August 8, 1889, DR. H. H. A. BEACH writes that he has for some time been applying the balsam of copaiba to indolent granulated surfaces, by first saturating charpie with the balsam, and, after squeezing out the superfluous balsam, bandaging the charpie upon

the ulcer. The results were highly satisfactory. It is simple, cheap, and quickly prepared, and is now becoming the accepted dressing in the Massachusetts General Hospital, being especially adapted to the flat, pale, granulating surfaces that commonly result from avulsions of the scalp, extensive burns and scalds, also for the cavities after operation for removal of necrosed and carious bone. It has succeeded in raising healthy granulating surfaces for grafting after other stimulating applications had failed. At the hospital it is applied with cotton-waste instead of charpie. The waste can be easily picked apart and cut into short bits by convalescents. The porous nature of the dressing permits a ready absorption of pus and of its partial disinfection by the copaiba, which imparts a fragrant balsamic substitute for the sourish odor of pus partly decomposed.

THE TREATMENT OF SEVERE CHOREA BY PROLONGED SLEEP.

We have already published the experience of Dr. Bastian as to the treatment of severe chorea by prolonged sleep induced by large doses of chloral, and his observations have elicited a paper from DR. GAIRDNER, which is published in the *Lancet* for August 3, 1889.

Dr. Gairdner writes that his experiments enable him to formulate the following conclusions as to the use of chloral in chorea: 1. That it sometimes succeeds in chorea absolutely, where other remedies fail. 2. That it can be depended on, as a rule, in very severe cases, to initiate a treatment which may be afterwards successfully carried out otherwise. 3. That in such cases it has an almost absolute power of suspending or controlling spasm during the persistence of its deep hypnotic action, and is therefore invaluable as a palliative (care being taken, of course, to avoid poisoning, either acute or chronic). 4. That this or other limitations will interfere with the curative action of the remedy in some very inveterate cases; the failure of chloral hydrate in these cases, however, being common to it, with all other remedies.

THE USE OF PHOSPHORUS IN SMALL DOSES IN THE TREATMENT OF RICKETS.

For the past two years DR. MANDELSTAMU, of Kazan, in Russia, has been using phosphorus in small doses in the treatment of rickets, and during that time he has administered the drug to two hundred and fourteen patients of different ages suffering from the various forms of the disease. Of these patients, one hundred and twenty were cured, forty-three showed much improvement, and for the rest the medicine had to be withheld owing to the development of intercurrent disorders. The children were given the phosphorus for several months and even for a year. The dose was 1 centigramme ($\frac{3}{20}$ gr.) to 1000 grammes (1 qt.) of cod-liver oil, 1 dessert-spoonful once or twice a day. After two months of this treatment the bones of the skull became more compact, and the fontanelles and sutures less prominent, the nervous crisis and the paroxysms of laryngeal stridor less frequent and pronounced. The patients increased in weight, and the general health manifestly improved. The author did not observe any inconvenience arising from the use of the drug. The phosphorus seems to act beneficially upon the dyspeptic signs which accompany rickets. But he remarks that it is best to choose cases in which catarrh of the stomach and intestines exists with tenesmus to cure this condition before proceeding to administer the phosphorus. He concludes as follows: Clinical observations perfectly justify the employment of phosphorus in rickets. Phosphorus acts better, more quietly, and more surely than any other drugs. The administration of the drug for a long time in small doses is well borne by children and does not produce any ulterior effects. Phosphorus acts favorably, especially in cases of symptoms depending upon the rickety diathesis. Under the influence of phosphorus, in the great majority of cases, the development of the disease is arrested.—*Medical Press and Circular*, July 17, 1889.

Reviews.

GENERAL ORTHOPÆDICS, INCLUDING SURGICAL OPERATIONS. By Dr. August Schreiber. Wood's Medical and Surgical Monographs.
New York: William Wood & Co. Price, $1.00.

The subject of orthopædics is undoubtedly a very important one, both to the physician and surgeon. The former may in many cases, if he possesses some information in regard to the early symptoms, which precede the more decided changes of these lesions, prevent the progress of the disease, or recommend surgical interferences in time to bene-

fit the patient. On the contrary, if such knowledge is wanting, the lesion remains unnoticed, and improper treatment, or more often no treatment, is advised, until the objective symptoms of the disease have progressed so far that the recognition of the trouble is only too evident to all, and also in many cases the time for surgical interferences is past, or if resorted to may only result in temporary relief, permanent deformity, or a useless limb. The importance to the surgeon of having a most thorough knowledge of everything relating to orthopædics is self-evident, since to him both patient and physician turn for assistance.

The frequency of the occurrence of cases which come under the head of orthopædics is also a very important reason why physicians and surgeons should be well-informed upon all relating to this subject. To quote from our author, in Prussia there are said to be fifty-six thousand cases of scoliosis alone; in England and Wales, no less than four hundred and nine thousand two hundred and seven cases of deformities of various kinds are to be found, of which one-fourth, or ninety thousand two hundred and seventy-seven, are met with in London. While we do not believe that the relative number of such cases is so great in the United States, yet the number of deformed individuals here met with is sufficiently numerous as to call for the special study of this class of lesions and the establishment of special institutions for their treatment.

The importance to every physician that he should have some knowledge of orthopædics being granted, it is also important that such information be given to him in an acceptable form. Now the above work of Dr. Schreiber's is one that, in our opinion, most certainly answers the purpose. It affords the general practitioner a means of acquiring all the necessary information, in order to recognize these frequent lesions, and in many cases to institute proper treatment, or refer the patient to those who have had more experience, and who possess the special appliances for the relief or cure of this class of cases. While the etiology and pathology of the lesions considered by Dr. Schreiber are both given, yet the descriptions are not encumbered by theories and discussions, confusing to the reader and useless in practice.

The treatment advised by the author will be found to be that which experience and investigation has proved to be the most suitable. Where he has adopted measures differing from those most generally accepted, his reasons for so doing are clearly and forcibly given. In concluding our notice of this work, we do so fully convinced of the value of its contents, and unhesitatingly recommend it to all who desire information upon the special subjects of which it treats. We regret, however, to speak unfavorably of any portion of the work, but the illustrations, for the most part, are so very poor, that their omission from the text would have been rather to its advantage than otherwise.

J. H. C. S.

SYNOPSIS OF HUMAN ANATOMY. By James K. Young, M.D.
F. A. Davis, Publisher, 1889.

The questions which naturally arise in one's mind, upon taking up a new book, are, Why was it written? why should we read it? In a word, What object has the author in publishing the book? How to answer these questions, in regard to the above work, we find its author has, in a measure, done so for us. He says, "The object of this little book is, as its title indicates, to furnish a concise though *complete synopsis* of human anatomy." And, again, the reason for such a synopsis, he writes, is "the limited time at their [students] disposal and the unlimited amount of medical material to be digested."

Let us see if we agree with the author in his answers. First, as to the object. Outlines of anatomy are not to be thrown aside as useless; they serve a certain purpose, and in a manner assist the student; but they must not be abused; they should never be the exclusive study and only source of information; they are, as Dr. Young well writes, "to facilitate the acquisition of a subject as difficult as it is essential." Second, while admitting that the student's time is limited, and regretting that the limit is very often too short, it is no excuse for imperfect or superficial knowledge, and, therefore, in all branches of medical education something more than outlines is demanded.

If a synopsis of human anatomy may serve a purpose, and we believe it does, it is very important that the synopsis should be a good one. In this respect the above work may be recommended as a reliable guide. Dr. Young has shown excellent judgment in his selection of illustrations, in the numerous tables, and in the classification of the various subjects, so that, if used as a synopsis only should be, the work has our full endorsement.

J. H. C. S.

Correspondence.

PARIS.

(From our Special Correspondent.)

The International Congress of Therapeutics, Materia Medica, and Pharmacology.

This International Congress has been the important event of the month. Although the sickness of one of its organizers somewhat interfered with the publicity necessary for such gatherings, by dint of hard work and energy Dr. Bardet succeeded in having all the preliminaries and the arrangements ready in time. The meeting was held in the Hôtel des Sociétés Savantes, 28 Rue Serpente, a building which by the way has an interesting history. It was formerly the mansion of a princely family, and a century or so ago passed into the hands of the Pankoucke family, the celebrated publishers, who for several generations used it as a dwelling-place. A few years since it was purchased by a scientific association, which has entirely renovated the structure, and fitted it for the purpose of scientific meetings and societies. It contains, besides a large well-lighted hall with about five hundred seats, several smaller rooms for committee or section meetings, secretary's office, cloak-rooms, closets for books and records, and every convenience in general for sedate, quiet scientists who appreciate comfortable seats and have due regard for other people's furniture. The new entrance is on what will be the Boulevard St. André-des-Arts, running from the Place St. Michel to the Boulevard St. Germain, opposite the new library building of the Faculty of Medicine. One good result of the new boulevard is that it will bring air and light into a labyrinth of old, narrow, and crooked streets, of which the Rue Serpente—a suggestive and merited name—is a good specimen.

The Congress was well attended, and attracted especially a large quota of foreigners from nearly all parts of the world,—except, of course, Germany. Yet she had been invited, and some of her scientists, among them Professor Flückiger, had sent in their adhesion. But at the last moment a request was received to strike the names from the lists. Although no reason was given, it was presumed the step was taken in obedience to some semi-official hint, which it is dangerous not to heed. It is unfortunate, as German delegates would have been received with due courtesy, and their presence would have greatly added to the interest of the gathering.

As it was, between five and six hundred physicians, pharmacists, and veterinarians sent in their adhesion, about two-thirds of whom attended some or all of the sittings, while some one hundred and twenty participated in the closing banquet on the Eiffel tower. There you may be sure foreign members were in full force, some being invited guests. But they made also a good showing on the roll, between 125 and 150 being in attendance. As regards nationality, they were as follows, so far as can be ascertained: Roumania, as usual, led the van with 25. But Great Britain sent in a contingent of 15, and Belgium 13. Italy and Spain had 11 delegates each, South and Central American States 14, Holland 5, Turkey 4, Switzerland 3, the United States 3, and Portugal 2. Besides, Russia, Austria, Mexico, Greece, Tunis, Egypt, Norway, and Bulgaria were also represented. To mention a few names, Professor Williams, of Boston, Dr. Monteressi, of Key West, and your correspondent stood for the United States; Professors Wood and Robt. Bartholow sent in their adhesion, but were not in attendance. Among the British delegation we may mention Drs. Gubb, Howard, and Burden, and Messrs. Burroughs, Christy and sons, Holmes, Martindale, and Wootton, of London. Drs. Van Bastelaer, Van den Corput, Crocq, Jorissen, and Romnelaer, of Belgium, need no introduction here, neither do Professors Semmola, of Naples, Schaer, of Zurich, Stockwiss, of Amsterdam, Muñoz, of Spain, Mahmoud-Pacha, of Cairo, Zambaco-Pacha, of Constantinople; and, among the French, Drs. Bucquoy, Cadet-Gassicourt, Dujardin-Beaumetz, Hallopeau, Huchard, Lépine (of Lyons), Moutard-Martin, and Constantin Paul. Professors Planchon, Wurtz, and Bourgoin, of the College of Pharmacy, Burcker and Marty of the Val-de-Grâce School, with a strong detachment from the Paris Society of Pharmacy, represented French pharmacy.

On Thursday morning, August 1, the Congress was called to order by the provisional president, Dr. Moutard-Martin. The assemblage soon organized by electing the same president; Dr. Dujardin-Beaumetz, vice-president; Dr. Constantin Paul, secretary-general; Dr. Bardet, secretary-adjunct; and recording secretaries, Drs. Blondel and Labbee. Presidents of honor and section officers were also selected, as will appear hereafter. President Moutard-Martin then returned his thanks in a short address, saying that physiology, chem-

istry, and therapeutics should always walk hand-in-hand, as a condition of progress. After which the gathering divided into two sections, therapeutics and materia medica on one side and pharmacology on the other, each to hold separate sittings in the morning, and both to meet in plenary congress every afternoon. About three-fourths of the members attended the first section, and the remainder, chiefly pharmacists, the second, although some physicians followed the pharmacists, and some pharmacists remained with the physicians, according to the questions on the programme.

For the nonce only topics interesting therapeutics will be considered, and to present the subjects in more convenient shape, instead of following the different sittings as they occurred, each question will be disposed of separately as a whole, though sometimes the discussions occupied portions of various sittings.

FIRST QUESTION.—*The Antithermic Analgesics.*

Chemical Composition of these Bodies—Relations between the Chemical and the Physiological Function—General and Special Physiological Actions of these Bodies, their Functional Classification and Clinical Applications.

Such was the wording of the first question on the programme, intrusted to Dr. Dujardin-Beaumetz as *reporter*. Professor Semmola, of Naples, a perfect master of the French language, directed the discussion as president of honor. And, by the way, it may here be remarked that the professor proved one of the most attractive figures of the Congress, and more than once showed that exquisite skill and *finesse* characteristic of his nation. Dr. Dujardin-Beaumetz, in a printed report, explained the state of the question. He said: "Since chemistry has formed by synthesis a whole series of bodies, all taken from the aromatic series, which have proved to be, first, powerful antiseptics; next, potent antithermics; and, lastly, analgesics, their number has increased every day, and one new discovery rapidly follows another. Fault has even been found with such multiplicity, but we never will have too many medicaments for allaying pain. The important point is to know precisely their elective action and therapeutic indications. Pain is so complex a phenomenon that the same substance will not relieve all its manifestations. The physiological problem is no less complicated. Most of these analgesics are antithermic, a fact showing the truth of the doctrine which declared animal heat to be the result of multiple actions. And, indeed, all the antithermics can be divided into three classes. Some act as antiferments, and prevent hyperthermy as they would any fermenting process. Others have a direct action on the blood-globules, and lower the temperature by decreasing the blood's breathing power. The last prevent hypothermy through their action on the cerebro-spinal centres; they almost exclusively also possess analgesic properties. But, on closely studying their physiological effects, we notice their elective action is exceedingly varied. . . . One last point, and perhaps the most delicate and complicated of modern therapeutics, is to ascertain what relation exists between a substance's chemical composition and its therapeutical properties. With a few medicaments the investigations have been successful. For instance, we know that on introducing by substitution (as modern chemists can do) into the caffeine formula a molecule of either the ethoxyl, the methoxyl, or the hydroxyl group, we can so modify its physiological properties as to turn it from a tetanic into a convulsivant, and especially an analgesic, medicine. For the present, and temporarily, from my investigations in connection with Dr. Bardet, I would draw the following conclusions: Antiseptic effects chiefly belong to hydrated derivatives, like phenols, naphthols, etc. Antithermic effects predominate in amidogen derivatives, like acetanilide, kairin, and thallin. Analgesic properties are more usually to be found in the same amidogen derivatives when to an atom of hydrogen a fatty radical, especially methyl, has been substituted, for instance, dimethyloxyquinizine (antipyrin), acetphenetedine, methylacetanilide. . . . Such are the different questions brought before the Congress for discussion." Dr. R. Lépine (Lyons): "Even with the healthy animal the action of the antithermic nervines of the aromatic series is complex. Like quinine, which they resemble, they stop the activity of the protoplasm, and mostly all alter the red globules, either through a transformation of hæmoglobin into meta-hæmoglobin, or a modification of the globule's constitution. But it is chiefly on the nervous system that their influence is noticeable. Hence my opinion that all true antipyretics are nervines. The nervine action, however, of antipyrin and other antithermics is something more than analgesic effect. They decrease the consumption of glucose, at the expense of the glycogen in the liver and the muscles. Their effect on the consump

tion of albuminoids being variable, and such consumption having but little influence on animal heat, it is to the decreased consumption of hydrocarbons that the hypothermy they produce is to be attributed. To sum up, the agents in question are poisons to the protoplasm, though less powerful than quinine. Their action is chiefly on the nervous system, although it is also dynamic, decreasing animal heat by checking the consumption of hydrocarbons. To call them analgesics is to give a wrong impression of their way of acting."

Dr. Masius (Liege) thought antithermics to be indicated in all febrile diseases, the heat due to fever not being a necessary process of natural elimination.

Dr. Williams (Boston), on the contrary, spoke in English against antipyretics. In his opinion they only retard convalescence, and seldom do any good. Then, by request, he repeated his remarks in very fair French, for which effort he was loudly cheered.

The discussion now deviated into one of clinics and medical practice—Dr. Desplats (Lille) greatly praising antipyretics in many affections, and explaining at length his experience with them and his mode of treatment. As may be expected in a question of doctrine, he soon found dissenters, Dr. Stockwiss (Amsterdam) saying he could not accept such a panegyric on antipyretics, which, in his opinion,—quinine being excepted,—are generally useless and but little better than poisons; and Dr. Semmola adding he quite agreed with Dr. Stockwiss. To his mind antithermics act like poisons. They afford a sort of temporary relief, but at the expense of the patient's strength and early recovery.

Firmer ground, however, was reached with Dr. Hénocque (Paris), who insisted upon the importance of spectroscopically examining the blood of patients submitted to a treatment with these nervine antithermics. As most of them decrease the proportion of oxyhæmoglobin and some, even in doses not usually poisonous, acetanilide, for instance, are apt to cause dangerous modifications, such as the formation of meta-hæmoglobin, there is great advantage in following up the state of the blood. He showed for the purpose an instrument named hæmatoscope, which can be used quite conveniently.

Dr. Assaky (Roumania) next read a paper on *di-iodosalicylic acid*, which he greatly recommended as an antiseptic, analgesic, and antithermic. The nature and preparation of the compound were not given very clearly.

A discussion on *exalgine* ended the subjects coming under the general heading of antithermic analgesics. Dr. Bardet (Paris) read statistics from the Cochin Hospital, where exalgine was administered in seventy-five cases. The record showed the chemical to be especially beneficial in dental and congestive neuralgias and congestive hemicrania (migraine). There is, however, an important point,—namely, to be sure to use the true exalgine—that is, methylacetanilide melting at 101° C. (214° F.)—and not some of its isomers which have different properties. For instance, certain chemists have been selling in England, under the name of exalgine, the aceto-ortho-toluid, which is different, therapeutically, and nearly inert.

Dr. Féréol (Paris) said he had not obtained very satisfactory results from exalgine, while Dr. Desnos (Paris) attributed the failure to insufficiency of doses. So far as he was concerned he (Dr. Desnos) preferred it to antipyrin. Yet he admitted exalgine to be apt to cause vertigo, a sort of drunkenness like quinine, an opinion which Dr. Dujardin-Beaumetz confirmed, adding the symptoms have no dangerous sequelæ, as eruptions and cyanosis are not to be feared. He said that although he was the father of exalgine, so to speak, he considered it inferior to antipyrin, chiefly owing to its sparing solubility.

Second Question.—*Antiseptics.*

Biology of Pathogenous Microbes—Action of Antiseptics either on the Micro-organism itself or on its Toxic Secretions—Mode of applying Antiseptics—Modifications of the Ground.

On Friday afternoon, Dr. Williams, of Boston, was requested to take the chair as president of honor. On complying with the invitation he made a few remarks in slow but very correct French, thanking his fellow-members for the distinction conferred, "which he was well aware was not meant for him personally, but as a mark of regard and friendship towards his country, the United States" [loud cheers].

Dr. Constantin Paul, *reporter*, speaking of the question under discussion, said, "Microbiology, by showing many diseases, especially the contagious and infectious, to be owing to micro-organisms, has greatly enlarged parasiticidal medication. Hence an attempt to classify these medicines according to their comparative activity. But it was soon observed that their properties vary with different sorts of microbes, and it was found necessary to establish a separate scale for each

kind of organism. As therapeutics only are to be considered here, none but pathogenous microbes shall be taken into account, and the parasiticidal action shall be reviewed as it occurs in artificial cultures, to the exclusion of the effect on the organism."

Taking up, next, the various sorts of parasiticides, he began with those preventing putrefaction, and divided them into six classes,—namely, 1, the eminently antiseptic, such as oxygenated water, sublimate and silver nitrate, which, in quantities of from 1 grain to 1½ grains will prevent the putrefaction of one litre of neutralized beef broth; 2, very strongly antiseptic, those having the same effect in quantities varying from 4 grains to 14 grains, of the type iodine, bromine, etc.; 3, strongly antiseptic, 20 to 72 grains, potassium cyanide, aluminium, zinc and lead salts, carbolic acid, and tannin; 4, moderately antiseptic, 90 grains to ½ ounce, quinine, boric acid, chloral, copperas, and caustic soda; 5, antiseptic, 6 to 96 drachms, manganese, calcium and barium salts, and alcohol; 6, very slightly antiseptic, 4 to 9 ounces, common salt, glycerin, and sodium hyposulphite. The foregoing is only a condensation of the very long lists compiled by Dr. C. Paul, from data already known to therapeutists.

As regards pathogenous microbes, the following information is more interesting. For instance, it has been found that the growth of the *typhoid fever bacillus* will be prevented by 1 part of sublimate in 100,000 parts of culture; quinine comes next, but far behind, in the proportion of 1 to 800, and carbolic acid in doses of 1 to 200. The *cholera bacillus* will not develop in acid media. Hence the slightest quantity of free muriatic acid in a culture will suffice, as will 1 per 100,000 of sublimate or 1 per 500, of quinine; of blue vitriol, or carbolic acid, 1 in 500 or 400 is necessary. The *tuberculosis bacillus* in cultures is interfered with by many antiseptic agents, and especially alum, menthol, iodoform, ether, chloroform, boric acid, alcohol, and boric and arsenious acids. But the cultures are completely sterilized by hydrofluosilicic acid, ammonia, iron fluosilicate, potassium fluosilicate and sulphide, and sodium silicate, while salicylic and benzoic acids, borax, chloral, coniferin, and urethan are utterly inert.

The influence of temperature is no less instructive. Tuberculous matter has a persistent vitality. It will not lose its infecting properties on being heated for twenty minutes at 60° C. (140° F.), or for ten minutes at --° C., or on being thoroughly dried at 30° C. (86° F.). Neither will it be destroyed on being submitted to maceration and putrefaction in water for a fortnight, or to a succession of freezings and thawings. The typhus bacillus, although its culture stops at 46° C., has also strong vitality. After six months it is still alive, and perfectly stands long dessication as well as freezing.

The cholera bacillus has but slight vitality. Its cultures die after half an hour's drying at ordinary temperature. A temperature of between 50° and 55° C. (122° to 131° F.), or a trace of some mineral acid, will suffice to kill all the microbes in a culture. Vegetable acids are less effectual. Freezing to —10° C. (—14° F.) has no effect.

The other microbes are less known. It has only been ascertained that, as a rule, they are not destroyed by congelation, a remark that should not be understood to apply to the yellow-fever germs, as the disease is almost unknown in Europe.

In the discussion which followed Dr. Constantin Paul's statement of the question, Dr. Semmola said he had obtained beneficial results from flowers of sulphur to produce intestinal antisepsy, given in doses of 15 to 30 grains every hour, with copious watery drinks. Gastric fevers especially, but also typhoid fever to a certain extent, are amenable to the treatment. The same medicament externally, dusted, for instance, in the bedclothes or the dressing of wounds and ulcers, was found a good antiseptic.

Dr. Constantin Paul, in reference to sulphur, recalled that it was an Italian physician, Dr. Poli, who was the first to recommend sulphites as antiseptics, and that at a time when ferments were not known to be living organisms. To which Dr. Semmola replied that it was not sulphites but pure sulphur that he was recommending; and Dr. Alvaro (Brazil) observed he had also employed sulphur with success in similar cases, only he preferred precipitated sulphur to the sublimed.

Antiseptics, Dr. Jorissen (Liege) said, are very beneficial in *erysipelas*, but to secure sufficient adhesion and penetration, it is necessary to combine them with a fatty substance. Lanolin being too sticky, vaseline preventing absorption, and lard increasing the cutaneous irritation, a better vehicle is a mixture of vaseline and cacao butter, which is always well tolerated. The most reliable antiseptic is sublimate, which scarcely ever fails, either with infants, adults, or old men. *Fistulæ in ano*, which are undoubtedly kept up by microbes, are equally benefited by antiseptics.

Corrosive sublimate, though other antiseptics might do as well, affords a rapid cure. But it must be introduced far enough,—at least one inch into the rectum.

Dr. Hallopeau (Paris) thought antiseptics are, together with prophylactics, important in *pelada*. Although the parasite has not been discovered, there is no doubt it exists, and should be fought against. Hence hair-combs and brushes, pillow-cases and head-coverings are to be frequently disinfected, either by means of the oven or solutions of sublimate, carbolic acid, etc. As to local treatment, it will consist in either killing the parasite or rendering the ground unfit for its propagation. A great variety of parasiticides have been employed, but at the St. Louis Hospital an alcoholic solution of turpentine is preferred, with 1 per 1000 of sublimate, for bathing the healthy portions of the scalp. The infested parts are treated with repeated blistering, a rapid process discovered by Dr. Vidal, and easily applied with the vesicating solutions now prepared. When the epidermis has formed again, again a blister is raised, care being taken that only small continuous portions of the scalp be vesicated at the same time. With this combined treatment, pelada, which usually lasts several years, and often a lifetime, can be cured in three or four months.

Dr. Hallopeau equally recommended local antiseptics in the treatment of *syphilis*, and preferably mercurials. In consequence as caustics he prefers either acid nitrate of mercury or powdered sublimate. The first, although by far superior to silver nitrate, is often discarded, owing to its painful application, but now the objection has disappeared since the discovery of cocaine's anæsthetic properties. Corrosive-sublimate powder needs careful watching lest it may cause accidents. But no danger is to be apprehended, and much good will result from lotions and baths with sublimate solutions of 1 in 3000 or 5000 parts. Syphilides of the breathing organs are much benefited by fumigations of cinnabar. But iodine and its preparations, especially iodoform, are equally useful. The last may be exhibited either in powder, in an ointment, or dissolved in ether, or even in the shape of gauze or Unna's plaster.

To conclude the chapter on antiseptics, let it be mentioned that at the Section of Pharmacology, M. Balme, of Grenoble, showed a very convenient *sublimate paper* for antiseptic purposes, and illustrated before the meeting its mode of preparation. The paper—white filtering-paper—is ready perforated, like postage-stamps, into small squares, about one inch wide and two inches long, and spread in sheets on little trays, where it rests on glass rods. It is next brought under a calibrated dropper, containing a solution of mercuric chloride and sodium chloride in distilled water, so titrated as to contain exactly 5 centigrammes of sublimate to each 3 drops. The dropper being adjusted to work slowly, 3 drops of the solution are let fall on the centre of each division of the perforated paper, and any convenient number of trays can thus be charged in a short time, without ever touching the solution or the wet paper with the fingers. The sheets, after drying in open air, are bound into little books or parcels, like court-plaster, convenient to carry in the vest-pocket, and with them the surgeon or physician can at any time readily prepare sublimate solutions of the exact strength desired, by simply soaking one or more squares in a given quantity of water. An advantage, pointed out by M. Vigier, is that while sublimate applied to cotton wadding becomes after a time partly insoluble, the change never occurs with good paper free from earthy impurities.

Third Question.—*On Heart Tonics.*

"Classification of these Tonics—Physiological and Toxic Action—Direct Action on the Cardiac Muscles and Nerves—Comparative Value of the Plants and their Active Principles—Therapeutic Indications." *Reporter*, Dr. Bucquoy.

This most important question was taken up at several sittings, and concluded on Saturday afternoon, at which meeting Mr. Holmes, of the Pharmaceutical Society of Great Britain, was president of honor.

Dr. Bucquoy, on exposing the state of the question, said, "The object of the therapeutist in heart-diseases is less to contend against existing lesions than to stimulate the organ's action when necessary, especially with a weakened or tired heart unable to perform its functions. It is in such conditions that heart tonics are indicated. For a long time *digitalis* has been almost exclusively employed and justly considered as the perfect type of a heart tonic; and we all know what wonderful results often follow medication with digitalis. Within the past ten years the list of cardiac medicaments has much increased, but their value and indications differ, thus imparting much interest to the question on the programme. The following are the new agents, coming after digitalis, which still holds the foremost position: Caffeine, con-

vallaria majalis, adonis vernalis, spartium scoparium, strophanthus hispidus and strophanthus Kombe, and scilla, next to which we may place antiaris toxifera, helleborus niger, erythrolœum guinense, and nerium oleander. Besides, most of the drugs contain one or more alkaloids or glucosides, to some extent presenting the same properties. It is most likely their modes of action are very varied, but on this point much uncertainty still prevails. In one respect all the drugs are alike,—namely, besides being all of vegetable origin, they are violent poisons, and thus attracted the attention of therapeutists. Their toxic effects differ, and need further investigations; but their physiological actions in medicinal doses are better understood. They stimulate cardiac contractions, regulate the pulse, and, as a rule, produce copious diuresis. At the same time it must be confessed the differentiation of the various heart tonics and their indications still remain incomplete. So far we know, for instance, that *digitalis* is most reliable, but it is often hardly tolerated, will cause gastric troubles, and is apt to accumulate in the economy. The *convallaria* and *strophanthuses*, on the other hand, are less trusty, but are better tolerated, and will not accumulate. The *scoparius* is best for regulating the heart-beats, and strophanthus for allaying dyspnœa and angina pectoris. But all this is very vague, and the data are often contradictory, a statement applying with double force to the active principles extracted from the plants. Amidst the conflict of opinions, one clear fact stands undeniable, —that is, digitalin and strophanthin no more represent digitalis and strophanthus than morphine does opium or quinine cinchona. As to therapeutic indications, when we leave the demesne of generalities, and try to establish specific values, in my opinion the whole chapter is to be rewritten, as both physiological experiments and clinical observations have as yet been insufficient."

General discussion now being open, Dr. Masius (Liege) said his experience is that *digitalis* is by far the best heart tonic, and the powdered leaves the best preparation of digitalis. The maceration and infusion, recently recommended, are inferior, and he but seldom observed the irritating action complained of by some.

Dr. Dujardin-Beaumetz, while on most points agreeing with his Belgian *confrère*, preferred a cold maceration of the leaves as an excellent diuretic and heart tonic. We c—d here the powder to be irritating and ill tolerated. But Dr. Masius, supported by several members, maintained the superiority of the powder as better representing all the properties of the drug, while some of its active principles may be absent from the other preparations. On the whole, this slight divergence aside, the general opinion was that digitalis is preferable to strophanthus.

Dr. Bucquoy next read an elaborate paper on the *strophanthic pulse*, illustrated with a series of diagrams. As the memoir is to be published in full with the sphygmographic illustrations necessary for its comprehension, suffice it to say that he concluded the effects of strophanthus to be a slackening and regulating of the pulse, which takes an "aortic character." It controls asystoly through its tendency to equalize, in favor of arterial pressure, the excess of venous tension. Strophanthus is assuredly a heart tonic, possesses lasting diuretic properties, and can be tolerated for a long time. The characteristic feature of the "strophanthic pulse" is the exaggerated amplitude of the pulsations, which give it the same appearance as with "aortic insufficiency."

Dr. Féréol (Paris), and with him Dr. Semmola, having praised *digitalin*, the first meaning Nativelle's crystallized digitalin, and the second Homolle's amorphous ——, at once several members were up in arms, Dr. Stockwiss deprecating the use of violent poisons so imperfectly known, and Dr. Dujardin-Beaumetz declaring himself an uncompromising opponent of digitalins or digitoxins of all sorts until their real nature is exactly known. An exception might be made in favor of the crystallized variety as offering at least some guarantee of uniformity, but it is exceedingly poisonous. As to the amorphous varieties, and there are many, some are but little better than patent medicines, and a prudent physician should avoid them all, a conclusion which Dr. Crocq (Brussels) supported.

Dr. Constantin Paul: "Much has here been said about heart tonics, but are there really such medicaments as tonics of the heart? I confess, after hearing all that has been said, I fail to be convinced. A tonic is a medicine strengthening a certain organ, but not temporarily only; its effect should be lasting. Quinine, for instance, is a model tonic in intermittent fever. With digitalis, strophanthus, and sparteine the case is different, and so it is with caffeine, which, by the way, is not identical with theine, but an isomer. They act on the heart-beats, but

give no strength to the organ. A fatigued heart may be likened to an old steam-engine still able to give useful work under careful management. When the engine slackens an experienced engineer will see to the flues, clean and oil all around, and the old machine will go on for a good while. But have a youngster in charge, and he will force the fire and burst the boiler. In the same manner, on giving strophanthus, you cleanse the economy by copious diuresis and relieve the pressure. Even a simple punction with the thermo-cautery often greatly favors the action of cardiac medicines. But giving caffeine under such circumstances is like adding more coal under an overworked boiler. One of the best heart medicines is the *convallaria majalis*, because, after producing cardiac regularity, it will keep it up for a long time. But the active principle—*convallarin*—is useless, and so is the alcoholic extract. The best preparation is a watery extract of the root."

Dr. Stockwiss said he could not agree with the conclusion that there are no heart tonics. But to speak only of practical results, his clinical and physiological experiments convinced him that digitalis is a true heart tonic.

Dr. Féréol, while thinking it would not be very difficult to force Dr. C. Paul to admit the existence of heart tonics, agreed to a great extent with his praise of convallaria, no medicament being tolerated so long. To keep it up for years, according to his experience, all that is necessary is to exhibit it for fifteen days, and then stop fifteen days, to take it up again indefinitely, with constant and reliable effects.

FOURTH QUESTION.—*New Drugs.*

"Chemistry, Pharmacology, Pharmaco-dynamics, and Therapeutic Applications of the Plants introduced within Ten Years, or the Principles extracted therefrom."

M. Planchon (director of the Paris College of Pharmacy), *reporter:* Two contrary currents now exist in therapeutics, one tending to the introduction of new plants and new preparations therefrom, the other favoring the abandonment of vegetable substances and the substitution of either their active constituents or of chemicals formed by synthesis. The first current has set in, especially among American and English practitioners, but also on this continent. Unfortunately, with some of these new drugs, the task of the pharmacologist is not easy, a meaningless, native name, and an incomplete fragment, a leaf or a root being often all the data we have to work with. The time is no longer when cinchona was used for a century before its active principle was known. Yet we must not neglect our predecessors. For instance, when *pichi* was presented, a short time since, pharmacologists were at first much embarrassed, while, had they consulted Ruiz and Pavon's *Flore du Chili*, they would at once have found its scientific name and description. In the same manner many medicaments, long forgotten, like convallaria, coronilla, scoparius, adonis, etc., are nowadays cropping up in modern therapeutics. Although new to us, they were familiar to ancient writers, and it is wonderful what stock of information and clear knowledge can be derived from the works of Bauhin, Clusius, Lobel, and others.

At all times, when a medicament has proved satisfactory to the physician, the first thing has been to find out the best form of preparation. The idea is to extract the active principle, alkaloid or glucoside, and it must be admitted therapeutics have thus been greatly benefited. For instance, had cocaine been unknown, the effects of coca would have been difficult to explain; quinine will do what bark cannot. Some alkaloids, like cotoine and scoparine, were discovered before the drugs themselves had been identified; and some, like codeine, are made by synthesis. But at this point several important questions confront us. Should the alkaloids and glucosides be substituted for the plants, and are they always preferable to a good galenical preparation of the drug? Have they even the same properties, and are we sure they are not formed during the extraction process? And, lastly, are the principles obtained by synthesis identical as to properties with the natural? All these questions have been occasionally answered offhand by more than one physician. But prudent men still hesitate, and we think this Congress should consider such questions.

Dr. Lefevre (Louvain) spoke against the unnecessary use of active principles when they are not perfectly familiar. The entire drug possesses often some advantages, and cannot always be replaced by any alkaloids or glucosides; digitalis, for instance, is not fully represented by any of the digitalins known at present, an opinion which Dr. Crocq (Brussels) approved of.

M. Petit (Paris) said the chemical analysis of drugs is most important, not only for ascertaining its value, but for deciding which preparation is most appropriate. An instance of this necessity is the blunder made by Claude Bernard, who conducted laborious experi-

ments with "narceine" without testing the substance he was using; and now the supposed alkaloid turns out to be a myth. On the other hand, when one principle has been extracted from a plant, it will not do to conclude hastily it represents all its properties, since we know that many vegetable substances contain more than one.

Dr. Muñoz (Spain) sent in a memoir on *hazeline* as a hæmostatic, greatly praising its value. But the article was rather roughly handled when it turned out the preparation is only a proprietary one, and not an active principle, as the name indicates.

THE FIFTH QUESTION,

relating to a universal pharmacopœia, Professor Schaer (Zurich), *reporter*, occupied the remainder of the last sitting. In conclusion, the Swiss gentleman said that the projected pharmacopœia should only comprehend the most important, especially the poisonous, preparations. The text might be in any language, but preferably Latin, and the titles in Latin, with numerous synonymes. A table of maximum doses should be appended. After an exchange of views, members in the main agreeing with Professor Schaer, his report was adopted, and there are hopes that a Universal Pharmacopœia may at last be agreed upon at the coming Milan Congress in 1890, when an International Medical Congress is to meet at the same time as the Pharmaceutical, and probably in connection with it in some respects.

The usual votes of thanks having been carried, the Congress adjourned, to meet for the last time in a farewell banquet on the first platform of the Eiffel Tower. There is but little to say of this part of the exercises, save that the dinner was excellent, the wines good, and the speeches very short.

BERLIN.

(From our Special Correspondent.)

The leading members of medical circles in Berlin have, of late, been strenuously opposing the stand taken by a certain number of younger physicians in favor of the hypnotic "Suggestion Therapeusis." In one of the last meetings of the Berlin Medical Society, held before the summer vacation, one no less than Virchow endeavored to demonstrate, in an unmistakable manner, the utter worthlessness of so-called cures of organic and functional troubles by means of suggestion; but he was unable to substantiate his conclusions from any formulated basis. Most valuable, concerning this question, are the results of the investigations of one of Germany's most noted clinicians, Professor von Ziemssen, of Munich. These results he has recently reported in an address on the subject. Von Ziemssen concludes, from most extensive personal experience, that hypnotism is valueless, or, at least, that its influence can only be a passing one even in slight functional disturbances; and, furthermore, that the procedure may do actual harm to many patients. The simplest forms of nervous disorders,—toothache and other neuralgias, headache, general lassitude, nervous excitement, and sleeplessness,—these are the conditions in which, primarily, a good result is frequently obtained. It is, therefore, the symptoms of the disease and not the disease that are relieved by hypnotism, and it is but very rarely that even the symptoms are influenced in any but a passing manner. In the first forms of general neuroses, above all epilepsy, chorea, and paralysis agitans, the reported favorable results have not been obtained, and regarding the influence upon deep-seated organic disturbances there is absolutely none. When only the simplest disorders are benefited, and these only temporarily, it is surely a questionable procedure that in order to attain its ends must produce an "experimental imbecility of the brain," as Meynert aptly calls it.

In hysteria, hypnotism possesses the power of causing a decided increase of the disease when resorted to frequently. It has been known to change slight hysteria into a condition of "grande hysterie," as described by Charcot. Certain severe accompanying symptoms of hysteria, such as convulsions, contractions, paralysis, etc., can be temporarily overcome by hypnotism. However, all that is accomplished is to change one form of abnormal condition of the brain into another. The fallacy of the fundamental principles of the Nancy school may be demonstrated not only upon hysterical but also upon healthy subjects,—viz., that the hypnotic condition is related to natural sleep, although not quite identical with it. A condition is induced which borders on imbecility, which may be recognized as a lasting influence upon the cortical centres of self-consciousness and will-power, together with a hyperæsthesia of the subcortical portions of the brain. The injurious influences upon the brain, which hypnotism frequently produce, must not be overlooked, as they are both extensiv

and lasting. Even now we can unhesitatingly assert that the claim of the Nancy school regarding the alleged harmlessness of hypnotism is false. Similarly one might endeavor to prove that the habitual use of hypodermic morphine injections was devoid of harm or danger. The statements are parallel. Von Ziemssen closed his address with the following words: "As yet the hypnotic influence has not reached its height with us in Germany; the enthusiasm for the wonderful curative agency is still on the increase. I, however, trust to the history of experience, which shows that the sooner the like influences reach the pinnacle of their glory, the sooner they are again precipitated to the natural level. I trust implicitly to the healthy mind of German physicians, whose scientific objectivity will teach them to deal firmly, and not be carried away with the fabulous speculations advanced by hypnotism or kindred methods." As it seems, our colleagues across the ocean are likewise endowed with this scientific objectivity.

Before us lies the report of Opitz regarding the use of antipyrin in the City Hospital of Dresden. He has observed as the result of single doses of 15 grains, or ninety-three grains daily, a considerable decrease in the quantity of urine voided by patients suffering from diabetes insipidus. Three cases are reported. After continued treatment, when other known remedies had failed, antipyrin caused an immediate abatement of the symptoms of diabetes insipidus. In the first case, the curative influence was prominent; in the second, it lasted for a long time, even after the use of the drug had been discontinued. In the third case, the amount of urine increased after the drug had been stopped, but decreased as soon as antipyrin was again resorted to. With the decrease of the urine and relief of the thirst the general condition of the patient also became greatly ameliorated, the weight increased, and sleep became natural. Two of the cases were of very long standing,—one over twenty years,—and the third case was most severe, the amount of urine voided being over sixteen quarts daily. Only once was an unpleasant accompanying symptom noticed, and that soon passed over. On one occasion the administration of the remedy was followed by vomiting and loss of appetite. The dosage should best be undertaken as follows: Thirty-two grains daily to begin with, in 7- or 15-grain doses, this in order to test the sensibility of the patient towards the drug. Then an additional fifteen grains can be administered daily until about ninety three grains (six grammes) are being given daily, and the decrease in the quantity of urine is well marked. After about eight days of treatment the drug should be discontinued in order to test the duration of its effects, and should again be resorted to when found necessary, the dose required having definitely been determined.

Notes and Queries.

A CASE OF ESSENTIAL EPILEPSY CURED BY TREPANNING THE CRANIUM.

BENDANDI communicated in his own name and that of DR. BOSCHI, to the Medical Chirurgical Society of Bologna, March 22, 1889, an interesting account of a case of essential epilepsy cured by trepanning (*London Medical Recorder*, July 20, 1889). Patient's history showed that he was of rather dull intellect, without hereditary disease, and non-syphilitic. When a child he had a blow with a stone on the occiput, but this was followed by no consequences. At eighteen an epileptic attack first appeared, after a fright. In the first year the attacks recurred once or twice a month, then became gradually less frequent, until for a period of ten years he only had three or four attacks in the twelvemonth. In 1888 they became very frequent, even two a day. When he first came under the author's observation, right hemiparesis with contraction of the flexor muscles of the right arm, and drawing of the right facial angle, was noticed. From the course of the disease and the character of the patient, and from the mode of onset of the convulsions, hysteria and hystero-epilepsy were out of the question. The clonic spasms and phenomena of depression of motility on the right half of the body, and the spasm of the facial on the right, all induced the authors to consider the case one of essential epilepsy, to which was joined some special lesion with a focus localized in the left cerebral motor zone. With the idea of removing this lesion, the authors determined, by a method similar to that indicated by Giacomini, the situation of the fissure of Roland, and thence the centres which could be affected by the lesion, and, using a trephine with a diameter of one centimetre, four times they made an ample breach, having for its centre the point already determined. Not finding above the dura mater evident

signs of lesion, they made in it a cruciform incision. A tablespoonful of colorless serous fluid escaped; this did not appear encapsuled, but seemed like the cephalo-rachidian fluid. The convolutions were flattened as if by compression, and softer than normal. To explore the subjacent tissue an incision was made by the bistoury for a depth of three centimetres. The finger was introduced into the wound, and no signs of suppuration or extravasation was found, the surrounding tissues only appearing abnormally soft; in a word, only œdema limited to the part explored was found. The dura mater was closed by catgut, the breach in the cranium was left open for the escape of any fluid that might be formed, and the cutaneous wound closed by the usual interrupted suture. The temperature never rose above 38° C., and the patient complained of slight dull pain in the cut, but nothing else. The attacks, which had been twice daily, appeared no more. In the twenty days succeeding the operation the hemiparesis increased in relation, perhaps, to the cerebral wound and the consequent exudation. But after this the improvement was steady, and now, two months after the operation, there have been no more attacks, and there is great gain in motility, the patient being able to write well, which he could not do before.

MANDRAGORINE—A NEW ALKALOID.

From the root of mandragora (*M. autumnalis* and *vernalis*), in olden times so highly esteemed as a sedative and an ingredient in love-potions, F. B. AHRENS has obtained an alkaloid which he calls mandragorine. This is a hard, brittle resin, melting at a temperature of 77° to 79° C., and uniting with sulphuric acid to form glittering crystalline scales, which dilate the pupil when outwardly applied. The free base is represented by the formula $C_{17}H_{23}NO_3$, consequently, although proved to be a distinct substance, it is isomeric with atropine, hyoscyamine, and hyoscine.—*Druggists' Circular*, August, 1889.

THE CONSTITUENTS OF LYCOPODIUM SEEDS.

A number of interesting studies have been recently published as to the constituents of lycopodium seeds. LANGER found in the spores 49.34 per cent. of oil, which contained cerides of two new acids, having the formulæ of $C_{16}H_{30}O_2$ and $C_{16}H_{32}O_3$. The first spores yielded only the former acid, older spores only the latter.

From the comparison of the therapeutic action of these two fatty bodies, the explanation will, perhaps, be found of the remarkable fact that sometimes in vesical catarrh, gonorrhœa, etc., lycopodium seeds possess most positive properties, while in the majority of cases they are without value.

Further, BUKOWSKY has found that the oil from the fresh lycopodium seeds is a mixture of a glyceride of a new acid, $C_{18}H_{36}O_4$, which he terms lycopodic acid, with other known fats.

Which of the above formulæ is the correct one is still undecided. On account of the ready decomposition of the oils, they should be administered in capsules for therapeutic purposes.—*Wiener Medizinische Wochenschrift*, July 27, 1889.

THEOPHYLLIN—A NEW CONSTITUENT OF TEA.

This new base, obtained from the alcoholic extract of tea, agrees in its elementary composition, $C_7H_8N_4O_2$, with that of theobromin and paraxanthin, but differs from both of these substances in its melting-point, mode of crystallization, and behavior with caustic soda.

It gives no xanthin reaction, but on evaporation with chlorine-water leaves a scarlet-red residue, which turns violet with ammonia, and is decolorized by excess of caustic soda. This body is described by KOSSEL, who discovered it as a dimethylxanthin.—*Centralblatt für Klinische Medizin*, July 27, 1889.

OIL OF EUCALYPTUS IN HEADACHE.

In the *Medical News* of July 20, 1889, DR. MORRIS J. LEWIS and DR. G. E. DE SCHWEINITZ report several cases of headache benefited by the use of the oil of eucalyptus, in doses of 5 minims, given from four to six times daily. In one case 20 minims were given with the apparent result of preventing the attack of headache, of which premonitory symptoms were already present. In their first case a malarial element was present, and the drug was prescribed for the malarial trouble rather than for the headache, but the great improvement of the latter symptom led them to employ the drug in cases where there was no malarial history. They believe that the greatest relief from the use of eucalyptu

will be found in headaches of the congestive type. They did not succeed with the drug in one case where the attack was brought on by an indiscretion in diet, although the patient obtained relief at other times; and in one case of ciliary neuralgia failure is reported; also in two others where there was organic disease of abdominal viscera.

A POISONOUS DERIVATIVE FROM CHLORAL AND GLUCOSE.

A. HEFFTER reports that when equal parts of pure anhydrous glucose and chloral are heated together in a closed vessel on a water-bath, a chemical combination takes place, resulting in the formation of two different compounds.

When the heat has been continued for about two hours, the mass appears homogeneous and dark brown, viscid while hot, and almost as hard as glass when cold. This mass was dissolved in alcohol, and the alcoholic solution diluted with much hot water, which caused the separation of resinous drops. The latter were filtered off, and the solution evaporated until all alcohol and remaining free chloral were dissipated. It was then diluted with water, filtered, and set aside to crystallize. The first crop of crystals, after purification, appeared in form of thin lamellæ of a mother-of-pearl lustre, which were tasteless, and were found to be free from any poisonous qualities. The mother liquid, on further evaporation, deposits star-shaped groups of needles, which, when purified, are white, but little soluble in water (1 in 154), and have a bitter taste. Their composition is $C_6H_{10}O_5.C_2HCl_3O$, or $C_8H_{11}O_6Cl_3$, there being a loss of one molecule of water [which *may* be derived from the glucose alone, as expressed by the first formula, which the author of the paper does not venture to assume].

This new compound is very poisonous, even in small quantities, and is being studied pharmacologically at present. Further information is promised shortly.—*American Druggist*, August, 1889.

A NEW TOPICAL PREPARATION OF IODINE.

M. EYMONNET uses paper free from size, which he saturates with iodide of potassium, and another paper similarly treated with iodate of potassium and tartaric acid. These papers, separated by a very thin sheet of plain paper, are then brought together with gutta-percha fasteners and enclosed in a thin sheet of gutta-percha. Plasters thus made will keep indefinitely, and the iodine does not appear until the paper is immersed in water. On application, iodine is disengaged from the paper during about forty-five minutes. The amount disengaged is about thirty centigrammes for each leaf. The author states that an application of these leaves for forty or fifty minutes produces better effects than can be had by five or six hours application of iodized cotton, or five or six paintings with the tincture. The plasters do not burn the skin, and are tolerated for from half an hour to an hour. When necessary they may be covered with gutta-percha, and the clothing thus be protected.—*American Journal of Pharmacy*, August, 1889.

SAFRANIN—A NEW REAGENT FOR SUGAR.

GRISMER has recently recommended the following as an admirable sugar test: 16 drops of urine are diluted with 5 times the volume of the safranin solution (1 to 1000), and boiled with 30 drops of caustic potash solution. If the urine contains sugar the solution is decolorized. This test possesses the advantage over Fehling's test, in that it is not decolorized by uric acid, creatinin, chloral, chloroform, peroxide of hydrogen, or salts of hydroxylamin. On the other hand, the solution of safranin and urine is completely decolorized by albumen, but only after very prolonged contact. Sometimes perfectly normal urine appears to decolorize safranin, but if this specimen of urine is subjected to the fermentation test it will always be found to contain a minute quantity of sugar. —*Wiener Medizinische Blätter*, July 25, 1889.

THE CURABILITY OF HEPATIC CIRRHOSIS.

The etiology of hepatic cirrhosis, if generally due to alcoholism or malarial infection, is still sometimes unknown. The most frequent cause is concentrated alcohol, most hurtful when taken on an empty stomach, as it is then most quickly absorbed. The veins which carry it from the stomach become irritated, and the irritation, extending from the portal veins, engenders an inflammatory process of the perivascular connective tissue, which, little by little, leads to hepatic sclerosis. As long as the hepatic lesion is limited to an embryonal neoformation, although ex-

tensive, SEMMOLA affirms that a good result is to be hoped from a rigorous milk diet. When, however, the atrophic process has become complete, the advantage obtained from milk diet can only be palliative. Clinical symptoms do not always tell us with which stage we have to deal; ascites, not being only determined by a mechanical cause, may be great, while the cirrhosis is still curable. On the other hand, there are cases of cirrhosis with no ascites at all up to the end. As an aliment milk entails the least work for the stomach, satisfies the needs of the general nutrition. The irritated gastric mucous membrane is the first to feel the good effect, and this is propagated to the other parts of the digestive tract, with its annexes, liver, etc. Not only is milk easily digestible, but it furnishes peptones, which facilitate tissue change, and thus milk diet increases the quantity of urea eliminated in the twenty-four hours. In all these ways, and by increased diuresis, rigid milk diet tends to improve the morbid conditions proper to hepatic cirrhosis.—*London Medical Recorder*, July 20, 1889.

NEW LANOLIN OINTMENTS.

DR. STERN, of Mannheim, has found to be useful three preparations with lanolin, which he names (*Therapeutische Monatshefte*, February, 1889) (1) sapolanolin, (2) lanolin wax-paste, and (3) fluid lanolin injection. The first is a mixture, usually, of 2 parts of green soap and 2½ parts of lanolin. With this he incorporates all the ordinary medicaments, excepting salicylic acid. He has found it specially valuable in the treatment of infiltrated eczema, parasitic diseases, and seborrhœa with thick crusts. With the addition of ten per cent. of white precipitate it renders excellent service in psoriasis capitis, usually clearing up the disease in from three to eight days' time, and needing only the application of an indifferent ointment to complete the cure. It never discolors the hair. The second preparation is exceedingly useful for an adhesive dressing, and is composed of 40 parts each of yellow wax and lanolin and 20 parts of olive oil, melted together, and shaken while cooling. It is of a bright yellow color, and of the thickness of the wax used by the hairdresser. It can be spread upon the skin, where it sticks. With this can be incorporated nearly all sorts of medicaments, only, when tar is added, a little more wax must be used. It is very useful in eczema of the face when oxide of zinc or boric acid is added to it. In squamous and vesicular eczema the following leaves little to be desired: Salicylic acid, in fine powder, 3 parts; olive oil, 17 parts; yellow wax and lanolin, each 40 parts. For the third preparation the basis is formed by lanolin, 25 parts; oil of almonds, 75 parts. To this can be added various medicaments, for instance: ℞ Zinc sulphate, 5 per cent.; water, 4.5 per cent.; lanolin, 20 per cent.; and oil of almonds, 75 per cent.—*New York Medical Journal*, August 3, 1889.

A NEW PROCESS FOR THE TREATMENT OF SEWAGE.

A private demonstration was given at the Wimbledon Sewage Farm on Friday last of a new process for the treatment of sewage which is known as the "Amines" process. Among those who were present were Lord Rosebery, Dr. Klein, Dr. Hake, Dr. Campbell Pope, Dr. Abraham, Mr. Percy Dunn, Mr. Chatterton, Dr. Lloyd, Mr. John Barker, Mr. Bennett Williams, and others. The process consists in mixing with a solution of lime a certain proportion of "herring brine," and then passing the mixture into the crude sewage, which is afterwards in the ordinary way passed along the culverts into the settling tanks. It is claimed for the process that it recognizes the fact that the principal evil to be dealt with is the presence in sewage in teeming numbers of bacteria, to whose vitality the putrefaction of the organic matters in solution and all the attendant phenomena are primarily to be attributed. The result of the chemical union of the two substances above mentioned is the evolution of "Amine" gas, which is very soluble, and spreads with great rapidity through every part of the liquid sewage. By experiment this gaseous reagent has been found to be antagonistic to the existence and propagation of every species of bacteria occurring in sewage and other similar waters. Thus, the effluent, after the sewage has been treated by the "Amines" process, is found, according to Dr. Klein, to be perfectly free from microorganic life, and it is at the same time inodorless and without color. These facts, which were shown to the visitors at Wimbledon on Friday last by Mr. Ellice Clark, together with other interesting details, which are shortly to be made public, were incontestable as far as they went. Undoubtedly a great step has been made towards the solution of the great problem of sewage treat-

ment by the discovery of a reagent by which sewage can be practically and effectively sterilized. We shall be glad to refer to this matter again as soon as we come to learn something more of its practical application. The London County Council would be well advised to permit an experiment to be made of this process at the pumping station at Crossness.

PRIMULA OBCONICA.

The favorite greenhouse plant, *Primula obconica*, appears to possess either irritant or poisonous properties, which render it as unsafe to handle as the poison oak (*Rhus toxicodendron*). Attention was called to this property of the plant by a writer in the *Garden and Forest* some months since, and the statement has been confirmed by others in the *Garden* (April 20, p. 368, and July 13, p. 35). It would appear, however, that it is only certain individuals with an abnormally sensitive skin who are thus affected, shown by the fact that one of the persons also experienced irritation from contact with the fruits of *Acer macrophyllum* and *Ostrya virginica*, which are covered with minute hairs. In some cases troublesome inflammation of the face and hands resulted from the handling of the *Primula obconica*. It does not appear to have been ascertained as yet whether the irritation is due to hairs or to a volatile acrid principle, as in the Anacardiaceæ. The unbranched jointed hairs themselves are apparently not adapted for causing mechanical irritation, having somewhat obtuse apices. They appear to secrete, however, a viscid yellowish substance, which is found coating their apices. The leaf, when chewed, leaves a tingling or acrid sensation on the tongue.—*Pharmaceutical Journal and Transactions*, July 27, 1889.

THE TREATMENT OF INSOMNIA.

According to the Berlin correspondent of the *Medical Press* (July 31, 1889) at the meeting of the Society for Medicine of the 1st inst., HERR JASTROWITZ gave an address on the subject. He first spoke of the employment of alcohol in its various forms of wine, beer, and spirits. Alcohol was given as a narcotic in acute diseases in cases in which it was desirable to use one that was not a cardiac depressant. Alcohol was first a cardiac whip, and then when the stimulant action had passed off a "somniferum." In chronic insomnia from cerebral disturbance it was a well-known prescription to make patients work hard or run fast, and then give them some strong beer. But even if alcohol was useful in furthering sleep, in melancholics the dread and nervous excitement were often made worse the following morning.

As regarded opium and morphine, it was a noteworthy fact that G. Mayer, of Aachen, considered them first as sedatives, and hypnotics only in large doses. A third property, that of a tonic, was very valuable. Persons who had become accustomed to take other hypnotics, after taking opium and morphine thought that the sleep following these was the most natural. These were indispensable sedatives in such diseases as cancer and tabes. It might be disputed that morphine was a tonic, but the experiences of sportsmen on themselves and their horses showed that after the injection of morphine they were able to accomplish greater feats than without. The effect of morphine in stenocardia, angina pectoris, and feeling of dread from deficiency of tone in the medulla oblongata, were mentioned. In congestion of the chest great caution must be used with morphine, as well as in diseases of the heart, as both paralyze the heart. These drugs must be used with great caution in chronic insomnia, for fear of setting up a dangerous and intractable morphine habit. Small doses only should be given to children in whooping-cough, and bromide of potassium substituted where it could be done. In senile insomnia, opium acted better than morphine; was superior also in intestinal diseases and in certain forms of melancholia and mania. He had used it gladly in delirium tremens. Codeine and narceine were the only other alkaloids from opium in use. Both caused less constipation, and were fairly good hypnotics. In Russia and France codeine was much used in bronchitis, and Lauder Brunton recommended it in abdominal pains. Narceine was much used in France for children. Chloral hydrate had the advantage of being the most powerful of all hypnotics. It never failed. Danger from it naturally increased with the dose. A large dose of chloral produced a condition resembling chloroform narcosis, which lasted till natural sleep followed. It was contraindicated in cases where the lungs showed great obstacles to respiration, and where the stage of excitation was very short, especially where there was no contraction of the pupils. He had in 1869 recommended a mixture of chloral and morphine; it had ad-

vantages, but it should never be given in large doses. Paraldehyde did not depress the heart. Large doses produced a condition resembling chronic alcoholism. It was not very dangerous. Patients quickly got accustomed to it, and the dose had to be increased. It was not suitable in bronchial irritations, but in affections accompanied by cutaneous itching it was very efficacious. It was not very useful in conditions of great excitement and dread, but in insomnia from "moral" causes it was. Hydrate of amyl had the fate to be quickly overtaken by sulphonal, but it was a good hypnotic in doses of .8 to 1 gramme (12 to 15 grs.).

Sulphonal was distinguished by its odorlessness and tastelessness, so that it could easily be given to unwilling patients. All observers were agreed that it did not act on the heart. The action was very slow, so that it was not so suitable for acute affections. It did not relieve pain, but it was unreplaceable in cases distinguished by motor restlessness, such as chorea. In mania it was best to give ½ to 1 gramme during the day and another dose in the evening. After long-continued use the patients suffered from giddiness, so that they staggered in their walk. Patients declared that they felt stupid, they could not move their arms or legs properly. These symptoms disappeared when the medicine was stopped. Urethan, methylal, and hypnon, from their being unsafe or unreliable, had fallen into disuse. All comparison of these drugs was possible only to a slight extent. The sleep after sulphonal was most like the natural. With long continuance it was not without its effect upon the heart.

ANTIPYRIN INCOMPATIBLES.

A short time since M. Carles called attention to a precipitate which is formed upon mixing solutions of antipyrin and extract of cinchona. M. Ollivier, who has been making further experiments, says (*Bull. Comm.*, June, p. 278) that all the active principles are precipitated together, and that there remain in the liquid hardly any perceptible traces of alkaloids or antipyrin. According to M. Carles, however, the precipitate is readily soluble in weak acids, so that it might dissolve in the gastric juice, and the mixture, though unsightly, might not be inert. Another apparent incompatibility has been recorded by M. Blainville (*loc. cit.*), who, having occasion to mix four grammes of antipyrin and five grammes of chloral hydrate in fifteen grammes of water, observed that the mixture assumed a milky appearance, and upon clearing deposited an oleaginous liquid. After decantation, this liquid soon crystallized, and then no longer possessed the taste of antipyrin or of chloral, but a flavor rather resembling that of coriander-seeds. Attention is called to the inconvenience that may result from the prescribing of complex substances, of which so little is known, together with other chemical substances, that may change their physiological action altogether, and it is recommended, as far as possible, when ordering them, simple formulæ, in which only distilled water and a simple flavoring agent enter, should be adopted.—*Pharmaceutical Journal and Transactions*, July 27, 1889.

RELIEF OF STRANGURY.

Dr. Luton, of Rheims, having highly recommended tincture of ergot internally for the immediete relief of strangury, we were recently induced to try a hypodermic injection of ergotin for the same purpose, inserting it in the fossa just behind the great trochanter. The results were all that could be desired. The patient had had a hypodermic injection of morphine about an hour previously, and was considerably under its influence when we were applied to for relief.—*National Druggist*, August 15, 1889.

CREOLIN INJECTIONS IN DYSENTERY.

Dr. Sosovski has found large enemata of dilute creolin very useful in dysentery. He employed a one-half per cent. solution injected into the bowel twice, or sometimes three or four times, daily, the quantity used for each enema being generally about five pints. The patients did not experience any burning sensation or abdominal pain. The treatment was employed in sixteen cases, not one of which proved fatal, although a considerable number of patients succumbed to the disease during the same epidemic. In two cases the disease was arrested after the second enema, in nine cases the bloody stools ceased on the third day, in two cases on the fifth day, in one on the sixth, and in one on the ninth. The remaining case, though more obstinate, ultimately recovered completely. In addition to these, two children under a year old were treated successfully by means

of creolin enemata. Again, another Russian physician, Dr. Kolokoloff, has used a one per cent. solution in a number of cases of adults with complete success.—*Lancet*, August 3, 1889.

ŒDEMA OF THE BRAIN.

According to Dr. Hugenin, of Zurich, inflammatory œdema of the brain or diffused encephalitis occurs after perforating wounds of the skull with injury to the brain, also in tumors of the brain where the centre breaks down and softening is going on towards the periphery, also in abscess and infectious diseases of the brain, and more rarely in cases where there is hemorrhage or a hemorrhagic infarct. It is, however, to the non-inflammatory variety of cerebral œdema that Dr. Hugenin has devoted his attention specially. Having made a large number of post-mortem examinations in cases of this kind, he has come to the conclusion that so long as the vessels within the cranial cavity maintain their normal condition, there is no fear of any fatal œdema resulting from circulatory disturbance in cerebral disease; but when there exist such morbid conditions as obliteration of the lymphatics or increased intra-cranial pressure, due to diminution of the cranium, or more particularly to an arrest of its ordinary growth, fatal œdema of the brain may be induced. He found that in children who had died from hyperæmia or œdema of the brain or slight hydrocephalus there was commencing meningitis, usually of an infectious character,—that is to say, due to the presence of streptococci. Fatal congestive œdema in children was found to occur only when there was obliteration of the channels leading from the space beneath the pia mater or obliteration of the Pacchionian bodies, such as is set up in the course of chronic meningitis.—*Lancet*, August 10, 1889.

USES OF SODIUM ETHYLATE.

In the *Practitioner* for August, 1889, Dr. Arthur Jamison writes that he has found sodium ethylate to be extremely useful for the removal of hairy moles which so often disfigure the face, especially in women. The mode which he employs is to cut the hairs as close to the mole as can be done with a very fine pair of scissors, and then paint it over with sodium ethylate by means of a fine glass rod.

When the mole has a varnished look from the application, he gently rubs the ethylate in with the glass rod to make it penetrate more deeply into the hair-follicles, being very careful not to let any of it run off the mole on to the skin of the face.

After the operation the mole will have a black look, and a hard crust will form over it, which will be nearly three weeks in becoming detached. When it comes off the hair will be destroyed, and the surface of the mole will have a somewhat cicatricial appearance of a much lighter color than before. Dr. Jamison also mentions that in those vascular areas seen on the sides of the nose in children, formed by vessels radiating from a common centre, a very small drop of the ethylate applied with a fine glass point to the very middle of the vascular area destroys or obliterates the vessels below, and then those radiating from it disappear, and no mark at all is left.

TO ABORT BOILS.

A writer in the *Medicinische Wochenschrift* says that a boil may be aborted in a very simple manner. If the skin over the site of the threatened invasion be scraped with a scalpel until a drop or two of blood exudes on pressure, further progress will be stayed. This must be done just as soon as possible after the first sensations of the coming furuncle are experienced.—*National Druggist*, August 15, 1889.

THE RATIONALE OF THE BROWN-SÉQUARD TREATMENT.

In the *Medical Age* for August 26, 1889, is published a paper with the above title, emanating from the Chemical Laboratory of Parke, Davis & Co. In this it is suggested that whatever value may be attached to the solution, proposed by Brown-Séquard as a nerve stimulant, is, perhaps, attributable to the alkaloid *spermine*, and an account is given of several experiments, both on man and animals, in which the hypodermic injection of $\frac{1}{10}$ of a grain of the hydrochlorate of spermine appeared to produce marked stimulating effects. The claims of Brown-Séquard, so grossly exaggerated and misstated in the daily press, have not been by any means disproved. His method of experimenting is, however, open to the danger of the production of septicæmia; and, since such a risk does not attend the employment of the alkaloid spermine, experiments as to the properties of the latter are by no means out of place.

—THE—

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Original Communications.

*RAILWAY SHOCK AND ITS TREATMENT.**

BY F. X. DERCUM, M.D.†

MR. PRESIDENT AND GENTLEMEN:—In making a choice of subject I was guided mainly by the consideration that an address before a body of medical men actively engaged in practice should be eminently practical in nature. Ere I have finished I think that you will agree with me that the subject of railway shock is one fraught with many practical questions, some of which bear an intimate relation to the routine of our daily lives, and which are important not so much because of the frequency of railway shock, but because of the valuable lessons which they teach. The theoretical aspects of the subject I shall be obliged to consider to some extent, but I propose doing so as briefly as the clear understanding of it will permit.

To many, doubtless, on first seeing the announcement of the title of this paper, "Railway Shock," the thought occurred that shock from railway injuries cannot differ in any essential point from shock produced by other

* Address delivered before the Ninth Annual Meeting of the Lehigh Valley Medical Association, August 16, 1889.

† Instructor in Nervous Diseases, University of Pennsylvania; Neurologist to Philadelphia Hospital.

causes. You will find, however, that the causation of railway shock is peculiar,—that its causation is composite, and that, therefore, the resulting condition presents special features. Certainly railway shock differs from ordinary traumatic shock, from surgical shock, and from purely emotional shock, and there is abundant justification for the use of the term.

Before proceeding, let us endeavor to obtain clear notions of shock itself. What is shock? What is its pathology?

Let us recall, to begin with, the classical experiment of Goltz. You will remember that he took a frog, placed him in an erect or vertical position, and then exposed the heart so that its pulsations could be readily studied. He then struck the abdomen a severe blow. Instantly the heart ceased beating, and only after a while did it resume its pulsations. The latter, too, were much weaker than before. Evidently the impression, the shock of the blow, had been transmitted to the nerve-centres, and thence, acting upon the heart, had caused it to become suddenly arrested and also for a time much weakened. Physiologists, as you know, express this phenomenon as one of reflex inhibition; but in whatever terms we state it, the cardinal point for us to recognize is, that it is one of sudden *cardiac paresis*.

The behavior of the heart, however, was not the only thing observed by Goltz. He noticed in addition that the blood, which had but a moment before distended the heart and vena cava, was gravitating into the abdominal veins, leaving the heart and its vessels practically empty. Evidently the same impression that had caused diastolic arrest of the heart had here caused paralysis of the walls of the abdominal veins, or rather of the vaso-motor system of nerves that control them; and we are now led to suspect that a general paralysis of the entire vascular apparatus is what really obtains in this form of shock. Indeed, among other things, this view receives ample confirmation from the elaborate sphygmographic studies of the pulse made in cases of shock by Furneaux Jordan,* the tension in the arteries being invariably very low. Again, it is extremely probable that even the capillaries are involved in this paralysis, for John Hunter† observed in a lady, whom he was bleeding, and who fainted during the operation,—and fainting is a kind of shock,—that the blood flowing from the vein, "instead of being dark and venous, was of a bright scarlet color, like that of arterial blood," a phenomenon which could only obtain provided the capillaries were much dilated.

Let us pause a moment and ponder upon the generalization we have just reached. The most salient feature of shock from a blow upon the abdomen is a general vascular paralysis. Evidently this means that the great vaso-motor nerve-centres have been paralyzed, and certainly it is in the highest degree unphilosophical to suppose that the effect of the blow is limited exclusively to these centres, or to attempt to explain all of the symptoms of shock by the mere vascular paralysis. It is known, indeed, as an absolute fact, that strong peripheral impressions will cause an abeyance of all the functions of the cord. S. Weir Mitchell has placed beyond all cavil the facts of paralysis from peripheral irritation,‡ and in dwelling upon the explanation of these strange phenomena, he quotes at length the conclusions of Morehouse, Keen, and himself, from which I extract the following pregnant sentences: "Either the shock of a wound destroys directly the vital power of a nerve-centre, or it causes paralysis of the vaso-motor nerves of the centre, with consequent congestions and alterations. *But there is no reason why, if shock be competent to destroy vitality in vaso-motor nerves or centres, it should be incompetent so to affect the centres of motion or sensation.*"§ Again, in speaking of various effects, quite common, the results of gunshot wounds, he says,‖ "These have been more or less vaguely treated of as shock, commotion, stupor, etc. The larger part of those who receive flesh wounds, involving no important organ, are but little affected at the time, or may even be unconscious of having been hit, and exhibit no well-marked immediate constitutional disturbance.

"In other cases, and particularly in wounds of graver nature, the patient instantly falls senseless, and so remains during a few minutes, or many hours, when he revives again, either completely, or to suffer from a continued state of depression known as the shock, and marked by the usual features of great weakness, feeble circulation, pallor, etc.

"In other cases the last-named symptoms

* Furneaux Jordan, "Hastings Essay on Shock, Surgical Enquiries." London, 1880.

† Cited by Lauder Brunton, "Shock and Syncope," p. 13.

‡ S. Weir Mitchell, "Paralysis from Peripheral Irritation" (*New York Medical Journal*, 1866, vol. ii. pp. 321 and 401).

§ *Loc. cit.*, p. 353. Italics in the original.

‖ *Loc. cit.*, pp. 403 and 404.

come on at once and without the intervention or accompaniment of unconsciousness.

"These very interesting states of the system may be due, it seems to us, either to an arrest or enfeeblement of the heart's action through the mediation of the medulla oblongata and the pneumogastric nerves, or to a general functional paralysis of the nerve-centres, both spinal and cerebral, or, finally, to a combination of both."

Again, he says, "A severe injury, as a gunshot wound of a limb or the neck, may produce its effects of unconsciousness and loss of power, by greatly weakening, or for a time destroying, with various degrees of completeness, the functions of all the nerve-centres and of their conducting cords." A little farther on occurs this significant paragraph: "The majority of physicians will, no doubt, be disposed to attribute the chief share in the phenomena of shock, in its various forms, to the indirect influence exerted upon and through the heart. There are, however, certain facts which, duly considered, will, we think, lead us to suppose that in many cases the phenomena in question may be due to a temporary paralysis of the whole range of nerve-centres, and that among these phenomena the cardiac feebleness may play a large part, and be itself induced by the state of the regulating nerve-centres of the great circulatory organ."

Mansell-Moullin, also, recognizes the general involvement of the nervous system, for he tells us that "shock is an example of reflex paralysis in the strictest and narrowest sense of the term,—a reflex inhibition, probably in the majority of cases general, affecting all the functions of the nervous system, and not limited to the heart and vessels only."* The word inhibition, however, mars this otherwise excellent definition. It implies that the various functions of the nervous system are suppressed or held in abeyance by some active agency, whereas the condition is, doubtless, one of simple loss of function, the result of violent molecular jar. To use a well-worn comparison, it is a loss of function similar to the loss of power in a magnet when the latter has been struck a violent blow. Not that I desire to give the impression that the nervous system must necessarily receive a violent mechanical jar, but merely a sudden profound and exhausting impression, whether the latter be a blow upon the stomach, the crushing of a limb, the wound of a nerve, or merely a violent mental shock.

Further, Groeningen† points out in the most conclusive manner that the vascular phenomena alone are utterly incapable of explaining the symptoms of shock, and attaches himself, with some minor reservations, to the theory of Leyden,‡ "that a powerful irritation, whether it impresses the cord directly, or indirectly through the mediation of a peripheral sensory nerve, provokes in it powerful (molecular) movements of the nerve-mass, and renders the same insensitive to the transmission of less intense excitations." Leyden includes in the resulting disturbances of function not only those of motility and sensibility, but also the action on the heart, on the vaso-motor nerves, and on the respiration. Groeningen, however, defines shock as "a fatigue or exhaustion of the spinal cord and medulla oblongata caused by a powerful sudden impression (insult)."§ This restriction of the field of shock-action to the cord and medulla appears to us to be most unphilosophical and entirely unwarranted. To what, for instance, is the paresis of the will, the general and profound mental anenergia, to be attributed if not to a participation by the cerebrum? Again, what becomes of the cases of shock due to mental influences alone, not to speak of shock (concussion) due to actual blows upon the head? Is it because the cardiac and vascular phenomena, the temperature phenomena, may be less marked in these latter instances, that they are to be excluded? If so, what becomes of the undoubted cases of *railway* shock,—a form of shock in which mental action plays so prominent a part? Surely, if the cord and medulla be capable of undergoing a suspension of function, due to violent molecular movements, the same must be true of the brain; true alike whether we have gross concussion or simple sudden exhaustion due to mental action alone. The fact that the various forms of cerebral shock—shock from emotion, shock from coarse vibratory jar, shock from actual trauma—form such widely different clinical pictures, cannot weigh against the truth of this proposition. That shock, having its point of departure, its focus of distribution, in the brain, should present special symptoms, must be expected on *a priori* grounds, and,

* Mansell-Moullin on "Shock" in "International Encyclopædia of Surgery," vol. i. p. 369, 1881.

† Groeningen, "Ueber den Shock." Wiesbaden, 1885.

‡ Cited by Groeningen, *loc. cit.*, p. 45.

§ *Loc. cit.*, p. 69.

further, that the symptoms should vary with the character of the impression also follows of necessity. It would be equally impossible to draw a distinction between the shock of the cord by a blow upon the abdomen or the concussion of the cord due to the impact of a bullet upon the vertebral column. The symptomatology is different in large part, but the principle is intrinsically the same. (See Leyden's view.)

Thus far, then, we have every reason to regard the symptoms of shock as referable to the nervous system as a whole. Further, we should expect on *a priori* grounds that certain symptoms, or groups of symptoms, should predominate, according to the part of the body by which the injury is received, and this, in a general sense, we find to be the case. For example, in shock from a blow upon the abdomen, vascular phenomena predominate; in shock from a blow upon the lumbar cord, spinal symptoms predominate (although vascular symptoms are also present); and in shock from a blow upon the head, of course, brain symptoms predominate. That shock of the cord does occur is known to every experimental physiologist, while the cases of Erb,* of Hunt,† that of Jordan,‡ and one lately placed on record by myself,§ show that it actually occurs in man.

Again, while the symptoms of shock are thus modified, according to the part by which the injury has been received, we must remember that it may be of all degrees of intensity, and that, therefore, individual cases injured in a similar manner may differ clinically. Further, the symptoms may be very much modified by the emotional state of the patient at the time of the injury. This fact and its importance we will presently realize. Again, as was pointed out by Jordan,‖ age is a modifying factor in shock. Children, other things equal, are less readily shocked than the middle-aged or the old. Lastly, the temperament of the individual, as has been recognized by all writers, exerts a powerful influence in determining not only the symptoms but also the occurrence of shock.

Let us now, in order that we may fully understand the subject, carefully rehearse the symptoms of simple severe shock. Let us take a case in which a powerful blow has been received, and let us suppose that the case has been observed *very shortly* after the occurrence of the accident.

We have, to begin with, profound, muscular weakness; secondly, a feeble, shallow respiration; thirdly, a feeble, slow, soft, almost imperceptible pulse; fourthly, great pallor of the surface; fifthly, great coldness of the surface; sixthly, a cold, clammy sweat. Examination further discloses that the sensibilities, both general and special, are blunted; that the will is weakened, if not altogether in abeyance; for the patient can only be stimulated to exert himself by repeated urging. In short, the whole picture is one typical of extreme depression.

I cannot do better, perhaps, in order to vividly recall this picture, than to cite the classical description of a case by Fischer:¶ "The patient, a strong and perfectly healthy young man, was struck in the abdomen by the pole of a carriage drawn by runaway horses. No serious injury was done to any of the internal organs, at least we have not been able, after a careful examination, to find any trace of one. Nevertheless, the grave symptoms and the alarming look, which he still presents, made their appearance immediately after the accident. He lies, as we see, perfectly quiet, and pays no attention whatever to anything going on around him. His countenance is sunk and peculiarly elongated, his forehead is wrinkled, and his nostrils dilated. His weary, lustreless eyes are deeply sunk in their sockets, half covered by his drooping eyelids and surrounded by broad dark rings. The pupils are dilated and react slowly to light. He stares, purposelessly and apathetically, straight before him. His skin, and such parts of the mucous membranes as are visible, are pale as marble, and his hands and lips have a bluish tinge. Large drops of sweat hang on his forehead and eyebrows. His whole body feels cold to the hand, and a diminution of temperature is readily detected by the thermometer, which indicates a degree and a half in the axilla and a degree Centigrade in the rectum below normal. Sensibility is much blunted over the whole body, and only when a very painful impression is made on the patient does he fretfully pull a wry face and make a languid, defensive movement. He does not move a single limb spontaneously; but, after being repeatedly and urgently requested, he

* Erb, "Ziemssen's Encyclopædia," American translation, vol. xiii. p. 349 *et seq.*

† Hunt, "Pepper's System," vol. v. p. 913.

‡ Jordan, *loc. cit.*, p. 39.

§ Dercum, "Remarks on Spinal Injuries" (THERAPEUTIC GAZETTE, May 15, 1889).

‖ Jordan, *loc. cit.*, p. 30.

¶ Cited by Lauder Brunton, *loc. cit.*, p. 3.

shows that he can still execute limited and brief movements with his extremities. If the limbs are lifted and then let go, they immediately fall as if dead. . . . . The pulse is almost imperceptible, irregular, unequal, and very rapid. The arteries are small and the tension very low. While the patient was being brought to the hospital, the pulse became quite imperceptible, and the cardiac sounds very irregular and intermittent. The patient is perfectly conscious: he replies very slowly and only when repeatedly and importunately questioned, but his answers are quite to the point. . . . He gave the details of the accident reluctantly and imperfectly, but in the main correctly. Only while he was being brought to the hospital did he refuse to answer at all. His voice is hoarse and weak, but his articulation is good. . . . His senses are perfectly acute. His respiration appears to be irregular, and abnormally long, deep, and sighing inspirations alternate with very superficial ones, which are scarcely visible or audible. While being brought to the hospital he vomited several times, and nausea and hiccough still remain. Any one who knew the patient, or had seen him shortly before the accident, could hardly recognize him now. His appearance, cold skin, and hoarse voice immediately recall the appearance of a cholera patient to the memory of the attentive observer; the characteristic dejections are alone wanting to make the resemblance complete."

In this graphic account you may notice that the pulse is spoken of as very rapid, while in the summary of symptoms I first gave it is mentioned as slow. That the pulse is probably always slow, as an immediate result of the accident, is shown by the observations of Jordan,* who, on making a special examination of the heart's action in forty-seven cases of shock from various causes, found it to be invariably slow. Jordan interprets the rapid pulse as a pulse of reaction. In this he is followed by most writers. By far the majority of cases of shock which we see are cases in which reaction has already begun, and in them we find, or are apt to find, a rapid pulse.

You will notice, also, that the senses, doubtless meaning the special senses, are spoken of as acute, while in our summary they are spoken of as dulled. It is very probable that this occasional sharpening of the special senses is also a symptom of reaction. This brings us to the discussion of the so-called erethistic form of shock.

Long ago Travers† distinguished from the form of shock we have been considering another, which he termed prostration with excitement, and which later writers have termed the erethistic form. Instead of lying absolutely quiet in the position in which they have accidentally fallen or been placed, the patients toss about wildly, complain loudly, say that they cannot breathe, act as though suffering the greatest agony, and frequently express their fear of impending death. They pay no attention to what is going on around them, being entirely taken up by their own suffering. Sometimes they are actively delirious. Their muscles tremble, and the breathing is rapid and short, now and then a deeper inspiration occurring. The pulse is rapid and soft. Instead of great pallor of the surface, the face is flushed, and the skin, instead of being cold and clammy, is at first hot and dry. But see what happens. "As the exhaustion increases the skin becomes covered with cold and clammy sweat, which is often very profuse. The face becomes pale and the expression haggard, the pulse innumerably rapid, irregular, fluttering; subsultus comes on; slight convulsions; coma more or less profound; and (it may be) death."‡ Evidently, then, the so-called erethistic form is at times only a precursor of the ordinary torpid form; and, as Lauder Brunton points out, "Patients recovering from the torpid form may come gradually to present the symptoms of the erethistic form."§ Without discussing the matter further, I am inclined to look upon the erethistic form as either a preliminary stage, or incomplete stage, of simple shock; or it is to be regarded as a stage of imperfect reaction from simple shock. I think with Groeningen, therefore, that this so-called erethistic shock is not to be considered as a separate form.

Having now formed a conception of shock in general, let us turn our attention to railroad shock in particular. Jordan, in speaking of general shock, recognizes four causes:‖

"1. Those which act on the corporeal organization.

"2. Those which act on the psychical functions.

* *Loc. cit.*, p. 45.

† Travers, on "Constitutional Irritation." London, 1827.

‡ Savory, on "Collapse" (Holmes's "System of Surgery," vol. i. p. 378).

§ *Loc. cit.*, p. 6.

‖ *Loc. cit.*, p. 8.

"3. Those which act on both the corporeal and the psychical functions in equal or unequal degrees."

4. Cold.

Without stopping to criticise the fourth cause, which, it seems to us, really belongs to the first,—namely, causes "which act on the corporeal elements,"—let us see under what head the causes of railroad shock are to be sought.

A moment's reflection will convince us that the causes of railway shock may be found under any of the first three of Jordan's divisions.

A railway accident may ensue in such a way that the subject of it receives a violent trauma, with instantaneous loss of consciousness, and the shock, then, is the result purely of the corporeal impression. Secondly, it may occur in such a way that the subject receives no physical injury whatever, but merely suffers from an intense psychic impression. Thirdly, the subject may suffer from a combination of both these causes; and this includes, indeed, the vast majority of cases of railway shock. Jordan tells us that "the principal feature in railway injuries is the combination of the psychical and corporeal elements in the causation of shock, in such a manner that the former, or psychical element, is always present in its most intense and violent form. The incidents of a railway accident contribute to form a combination of the most terrible circumstances which it is possible for the mind to conceive. The vastness of the destructive forces, the magnitude of the results, the imminent danger to the lives of numbers of human beings, and the hopelessness of escape from the danger give rise to emotions which in themselves are quite sufficient to produce shock, or even death itself. Syncope, or concussion of the brain, may destroy consciousness for a time, or possibly altogether; but if consciousness return, depressing influences still operate, although less injuriously, but on a blunted nerve-power. All that the most powerful impression on the nervous system can effect is effected in a railway accident, and this quite irrespectively of the extent or importance of the bodily injury. Indeed, if there be no bodily injury whatever, the shock may, nevertheless, be intense, and be followed by ulterior results, the nature and mode of termination of which it may be difficult to foresee. With the fullest extent of mental shock, the extent of bodily injury may vary greatly, from an abrasion of the skin to the crushing of the body into a shapeless mass."*

We can fully understand, then, that sequelæ of the most persistent and distressing kind should result from railway shock. The sudden, excessive, exhausting discharge of nervous energy in the excitement, the fright, the horror of the moment, must certainly result in a general weakness more or less marked, more or less enduring. That such a condition does result is a matter of daily clinical experience. It was fully recognized by Jordan, who termed it chronic shock or chronic asthenia, while later writers have termed it traumatic neurasthenia.

If we add to this the fact that in railway accidents the trunk and head are particularly liable to injury, that the body, as a whole, is apt to be "thrown violently into contact with surrounding objects," and that brain or cord symptoms are correspondingly present, we are at length in a position to appreciate what is meant by "railway shock;" and the subject assumes still deeper significance when we are brought face to face with the fact that degenerative processes, actual organic changes, may occur in the nervous centres themselves.

Recognizing, then, that railway shock is made up of two elements,—physical and psychic,—we can readily understand that in any given case the symptoms will vary according as the one cause or the other predominates. As Page and other writers before him have pointed out, shock from purely mechanical injury, such, for instance, as the crushing of a limb, is relatively short, and not, as a rule, followed by symptoms of general nervous disturbance, while shock from purely psychic causes is usually very persistent. Page† says, "It is a seemingly anomalous and most noteworthy fact that the collapse which in these railway accidents accompanies serious bodily injury, such as severe laceration of limb or fracture of bones,—always excepting the collapse from severe concussion of the brain,—is not followed, or is, indeed, very rarely followed, by the train of after-symptoms indicative of general nervous shock. This is a fact of the greatest interest and importance, and one which will help to throw light upon those symptoms of general

* *Loc. cit.*, p. 37.

† Page, "Injuries to the Spine and Spinal Cord." London, 1883, p. 150. That this does not always hold good is shown by two cases reported by Knapp, "Nervous Affections following Injury" (*Boston Medical and Surgical Journal*, November 1 and 8, 1888; Cases XI. and XII.).

nervous shock which are so often seen after the slighter degrees of initial collapse." As an example of the persistence and the kinds of symptoms presented by cases in which the psychic cause largely predominates, Page cites* the case of a tall and powerful man, aged 46, who "was in a very severe and destructive collision. He received bruises over both arms and legs, and also a blow upon the face, which abraded the skin over and fractured the bones of the nose. He was not stunned. He lay for several days after the accident in a state of great nervous depression, with feeble and rapid pulse, and inability to eat or sleep. He suffered at the same time much distress from the fact that a friend, sitting beside him in the carriage, had been killed, and this seemed to prey constantly on his mind. The bodily injuries progressed rapidly towards recovery, and in seventeen days after the accident he was able to be moved home. Nine weeks after the accident he had fairly recovered from his injuries, and made no complaint of bodily sufferings. The ordinary functions of the body were natural, but his mental condition showed extreme emotional disturbance. He complained that he had suffered continuously from depression of spirits, as if some great trouble were impending. He feels very upset at our visit, and begins to cry. . . . His voice is very weak and indistinct, and occasionally, he says, it is almost inaudible. He sleeps very badly, waking frequently, and being constantly troubled by distressing dreams. His pulse is weak, 104. . . . Words, in fact, fail adequately to portray the distressing picture which this otherwise strong and healthy man presented." Subsequently he underwent a slight and gradual improvement, but four years afterwards his medical attendant wrote that "his appearance was much altered, that he looked older, haggard, and that he had become very bald, that he was very depressed, sometimes had palpitation, loss of sleep, bad dreams, very easily tired, had lost all his energy, and was easily upset."

An interesting case of this form of shock was recently studied by myself. A gentleman, accompanied by his wife and child, started to spend a two weeks' vacation at one of the smaller resorts along the New Jersey coast, and to reach which it was necessary to change cars at a small way-station. The party alighted in safety on the platform of this station, which was raised a few feet above the level of the surrounding ground. It so happened that attached to the rear of the train were several freight-cars filled with railroad-ties, which laborers were unloading at various points along the road. During the stop made at this way-station a number of ties were likewise thrown off. One of them, however, had become so jammed into the body of the pile that the laborers, during the short time allowed, could not disengage it, and it was left jutting several feet beyond the side of the car. The train being started, this tie swept the platform on which our passengers had alighted, like a scythe. The husband, who was now at a little distance from his wife and child, was the first to perceive the danger. He cried out to his wife to lie down, while he himself jumped for his life. His wife obeyed, but as she did so she saw her child, a little girl of 6, struck full in the abdomen and shockingly injured. She herself escaped all physical injury, but became at once uncontrollably excited and hysterical. She remained in this condition, with but little change, for three weeks, when, being three months pregnant, she miscarried. Subsequent to this she gradually improved, but she was evidently a very much changed woman. A year after the accident she was still very neurasthenic. From having been of a bright and cheerful disposition she became depressed and melancholic. Her color, too, was now habitually pale and of a very sallow tinge. She was exceedingly nervous, weak, and irritable, and utterly incapable of managing her household. Her pulse was weak and rapid, and her knee reflexes sluggish. Her back was painful, and superficial tenderness was discovered over the lumbar region. Her grip was decidedly tremulous. Regarding the miscarriage, it should be stated that though she had been a number of times pregnant, no miscarriage had ever occurred before. She had always, though of an admittedly nervous temperament, enjoyed good health.

Various instances might be cited, if time permitted, in which neurasthenia and hysteria, more or less marked, and even actual insanity, resulted from shock.

Page attempts to explain the marked difference between the sequelæ of shock from gross mechanical injury and shock from psychic causes by saying that in a case, for instance, of a broken leg, the patient has a definite injury on which his mind may dwell and the progress towards recovery of which he daily sees. Further, the enforced rest is

* *Loc. cit.*, p. 151.

beneficial, and, the injury being definite, "there is less likelihood of a dispute arising as to compensation." That these considerations are, however, not sufficient in themselves to explain, on the one hand, the absence or short duration of the symptoms of nervous shock, or, on the other, their long-continued existence, is vaguely recognized by Page himself, for he even resorts to the remarkable expedient of blaming bromide of potassium for the protraction of the symptoms!

It may be that in the present state of our knowledge no perfectly satisfactory explanation can be given. However, may it not be that in shock from severe bodily mutilation, the very depth and intensity of the process renders the nervous system insensitive to the psychic impressions, just as a nerve, other things equal, already exhausted by one stimulus, is insensitive to others? Remember that a man whose limb or whose trunk is crushed in a railway accident, is hurt, as a rule, suddenly and unexpectedly,—*i.e.*, before he has time to realize what is about to happen, or has happened,—and that the very reception of his injury and the sudden oncoming of collapse makes the additional psychic shock impossible. Remember the picture of extreme anenergy, both mental and physical. Remember the torpor motor and sensory, and you will realize that here the additional factor of emotion can play no *rôle*. Certainly this explanation is in harmony with the facts. Why the sequelæ of psychic shock should be so persistent does not concern us. It is simply the fact with which we have to deal.

Further, how serious and profound purely psychic shock may be is illustrated by a case related by Lauder Brunton, and which is so interesting that I may be pardoned for quoting it. "Many years ago the janitor of King's College, Aberdeen, had rendered himself in some way obnoxious to the students, and they determined to punish him. They accordingly procured a block and axe, which they conveyed to a lonely place, and, having dressed themselves in black, some of them prepared to act as judges, and sent others of their company to bring him before them. When he saw the preparations which had been made he at first affected to treat the whole thing as a joke, but was solemnly assured by the students that they meant it in real earnest. They proceeded to try him, found him guilty, and told him to prepare for immediate death, for they were going to behead him then and there. The trembling janitor looked all around, in the vain hope of seeing some indication that nothing was really meant, but stern looks everywhere met him, and one of the students proceeded to blindfold him. The poor man was made to kneel before the block, the executioner's axe was raised; but, instead of the sharp edge, a wet towel was brought smartly down on the back of the culprit's neck. This was all the students meant to do, and, thinking that they had now frightened the janitor sufficiently, they undid the bandage which covered his eyes. To their astonishment and horror, they found that he was dead."* Surely no mechanical shock ever killed more surely or more swiftly.

Another interesting case is related by Baunis.† A farmer, accompanied by a number of Arabs, had set out to kill a panther, which was making the farm insecure. Barely had he fired a shot before the panther leaped upon him and seized him in his claws. The bullets of the Arabs, however, immediately despatched the animal, and thus liberated the farmer. The latter was removed to the lazaret. Baunis discovered several scratches on the shoulder which might have been grasped by one of the animal's paws. The scratches were entirely superficial and had hardly bled. However, the patient was in a condition of deepest prostration. Face pale, skin cold. He was fully conscious, but was suffering from the indescribable impress of the fright he had received. Baunis in vain made use of stimulants and of moral persuasion; the next morning the unfortunate man was dead. At the autopsy no traumata whatever of the abdominal or thoracic cavities, nor of the central organs, were found. The injury of the shoulder proved to be entirely superficial, and had not involved the joint.

Page‡ cites two fatal cases the result of railway collision, and they are especially interesting from the fact that death was delayed for several weeks. The first was that of "a man 40 years of age, of exceedingly delicate physique, who was in a collision at night. The accident was a slight one, and he was the only passenger injured. He was said, in the official report, to be 'violently shaken,' but he was able to go on home. The next

* Lauder Brunton, *loc. cit.*, p. 8.

† Cited by Groeningen, *loc. cit.*, p. 137.

‡ *Loc. cit.*, p. 168.

day he was delirious, and on the third day he was still talking somewhat incoherently. He complained of being much shaken and feeling seriously injured, but there was no evidence discoverable of bodily hurt. He improved for a time, and his condition was not thought to be serious. He never seemed, however, to make any marked progress, and four weeks after the accident he became more prostrate, and greater anxiety was felt about him. From this time he gradually got weaker and weaker, and died on the thirty-seventh day. No organic disease whatever was found on post-mortem examination in any of the viscera.

The other case was that of "an apparently strong and healthy girl, 19 years of age, in good position in life, who was in a most serious collision. She received no bodily injury, but on the night of the accident she woke screaming that the engine was rushing into the room. Her illness followed much the same course, and she died in about five weeks, no structural disease whatever being found after death. The brain and spinal cord were examined in both instances."

Again, some years ago, there was brought to the nervous clinic of the University a child of 4 years, in which marked imbecility and permanent loss of speech had followed a fright by a drunken man. Professor H. C. Wood is in the habit of relating to his class a similar case, in which loss of speech and epilepsy followed a protracted ride in a railway-car, the child being the while in a perfect paroxysm of terror. Cases such as these are certainly very significant as indicating actual organic changes as the result of psychic shock.

Having now formed an idea of psychic shock and its possible *rôle* in railway accidents, let us turn our attention briefly to the physical shock that may be received, and determine whether the latter is always the transient affair that many writers would have us believe. In many cases it is impossible to separate the two elements of shock, and also to estimate such complicating factors as loss of blood. However, in the instance of simple and uncomplicated direct shock (concussion) of the cord, the symptoms can be readily studied, and these cases we shall use as illustration.

That the cord is actually the subject of shock I need hardly repeat. Despite its deep situation and despite its elaborate protection, it is known to suffer severely from blows upon the spinal column. That temporary concussion of the cord—*i.e.*, transient arrest of function—can occur is indubitably proved by the cases of Hunt,* in one of which a bullet had lodged against a vertebra, but without in any way injuring the spinal canal, and, in the other, the cord had been shocked by a fall upon the feet. In both cases the ensuing paraplegia was transient. The case reported by Jordan† proves that shock to the cord may in every way be as fatal as shock to the brain. The case was that of a man who had "discharged a pistol into his mouth and imdiately died. Examination of the body showed that the bullet struck the body of the second cervical vertebra; but, beyond slight laceration of the tongue and of the upper part of the larynx and pharynx, no injury was done; no vertebra or any other bone was broken. The naked eye could detect no change in the upper part of the cord or the membranes."

Further, that shock to the cord is *not always* a transient affair is shown by a case already placed on record by myself;‡ and, secondly, that permanent changes in the cord occur as a result of spinal concussion is ably maintained by Gowers,§ who, in addition to cases in which hemorrhage into the membranes, or into the substance of the cord, occurs, recognizes also those cases in which "no lesion of the cord has been found, either with the naked eye or the microscope, a few days after the injury." Further, he tells us, that "in other instances, in which the cord is examined some weeks or months after the accident, the signs of chronic myelitis are found, in scattered foci or more diffuse tracts, in the white columns or gray substance." He cites the case of a lady who was merely shaken in a railway collision, who, in a few days developed paraplegia, and in six weeks was dead, and in whom a post-mortem examination revealed "indications of subacute myelitis, chiefly in the white columns, varying in its extent in different regions, but in most parts considerable in the pyramidal tracts." Edes‖ also records four cases of degeneration in the postero-lateral columns of the cord, the result of spinal concussion, and in one of these cases determined the actual existence of the lesion by an autopsy. Similar results were reached

* *Loc. cit.*

† *Loc. cit.*

‡ Dercum, *loc. cit.*

§ Gowers, "Diseases of the Nervous System." Philadelphia, 1888, pp. 435–437.

‖ Edes, *Boston Medical and Surgical Journal*, September 21, 1882.

by Duménil and Petil,* and Spitzka† also states that shock and injury are among the causal factors of both posterior and disseminated sclerosis. Other writers are also in harmony with these views.

While some of the cases of organic disease of the cord following blows upon the back are due to intramedullary hemorrhage, and others to small foci of inflammation, others still appear to be due to a simple degenerative process, just as though the vitality of various tracts had been permanently affected by the concussion.

We have considered thus far, though briefly, the elements that enter into railway shock, as well as some of the sequelæ. Let us now turn our attention to treatment. What we have thus far considered will now be found to have more or less practical significance.

The treatment of railway shock, as well as of shock in general, naturally falls into two subdivisions,—first, the treatment of the stage of shock itself; and, secondly, the treatment of its sequelæ. In the treatment of the stage of shock itself two objects must be born in mind,—first, the averting of actual death and the production of a healthy reaction; and, secondly, the averting, if possible, of either functional or organic sequelæ.

How, then, shall we treat a case of profound general shock?

Let us remember that the symptoms of shock are essentially paralytic in their nature. Let us recall for a moment the feeble, almost imperceptible pulse, the feeble respiration, the cold, clammy surface, the extreme pallor, and the profound muscular weakness. The first thing that occurs to us is the use of a cardiac stimulant, and in all times alcohol has been used for this purpose. Whiskey, and preferably whiskey to which hot water has been added, is to be given, if possible; but, it may be, either because the patient is vomiting, or by reason of the very depth of the shock itself, no decided effect is produced. Ammonia, in its various preparations, also suggests itself; but, for like reasons, its effects may be inappreciable or altogether transient. A powerful remedy, however, we have in digitalis. Lauder Brunton‡ suggests its use in shock, basing his opinion upon the case of Wilks, in which shock followed labor, and in which recovery ensued on administering tincture of digitalis in ½-drachm doses every half-hour. That in digitalis we have a most valuable remedy there can be no doubt, and that in urgent cases it should be used in large doses, if at all, is equally true. It has the additional advantage of being readily administered subcutaneously, and, with proper care, can thus be given with great accuracy. Ten to twenty minims of the tincture, slightly diluted, can be injected at short intervals until some effect is noted upon the pulse. Further, atropine administered in the same way, in small doses and not too frequently repeated, may also be used to the same end, this drug being, as we know, a stimulant to the circulation, and notably to the vaso-motor centres.

However, we must remember that shock affects the nervous system as a whole, that not *one* system of centres but *all* are affected, and that, therefore, some remedy, more general in its action, should be employed. Such a remedy we have in strychnine. I have for some time past regarded strychnine as one of the remedies of the utmost importance in shock. Mansell-Moullin§ and Groeningen‖ both recognize its value, especially the latter. Certainly, in profound shock—the shock that threatens to be fatal, shock that refuses to yield to other measures—strychnine should be given subcutaneously, and, if necessary, in massive doses. In extreme cases, I should not hesitate to use it in doses of $\frac{1}{10}$, or even $\frac{1}{5}$, of a grain. On *a priori* grounds alone, the remedy must be regarded as of the utmost value, for by no other means can the nervous system be so profoundly impressed, so rapidly re-energized. It is strange, indeed, that it has been not more frequently resorted to.

While these thoughts are passing through our minds, we must not forget that our patient is cold, cold even unto death, and that artificial heat is one of the very first desiderata. This heat can be supplied by cans or bottles of hot water, or other heated objects. The best of these means, however, meet the indications but imperfectly. The late Dr. Hunter, of Philadelphia, suggested the use of hot baths, but even these threaten to exhaust the almost dying patient by the unavoidable handling. Recently, in a case of collapse, occurring in a child during the course of a pleurisy, and in which the temperature fell to 96.5°, I caused an ordinary hospital water-bed to be filled with hot water, and, having

* Duménil et Petil, "Commotion de la Moelle Épinière" (*Archives de Neurologie*, 1885, vol. ix. pp. 1, 145, 307).

† Spitzka, "Pepper's System," vol. v.

‡ *Loc. cit.*, p. 17.

§ *Loc. cit.*, p. 373.

‖ *Loc. cit.*, p. 232.

covered it with several layers of flannel blankets, placed my patient upon it. The result was gratifying in the highest degree, the temperature of the body soon rising to a little above normal.

Evidently this expedient meets every indication. Not only have we a large amount of heat applied to a very large surface of the body; but, what is very important, it is *dry* heat. Certainly, by no other means can the temperature of the body be so readily influenced as by the *hot*-water-bed.

Further, there can be no doubt that sinapisms to the epigastrium, and large enemata of hot coffee, are also conducive to reaction. The subcutaneous injection of ether is, likewise, also beneficial, though, in the cases in which I have seen it used,—namely, collapse during abdominal operations,—it seemed to act rather as local irritant, and thus stimulating the heart in a reflex way.*

We must remember, above all things, that our patient must be kept in an absolutely horizontal position, with the head rather lower than the trunk, that he must not be moved about or lifted unnecessarily, and that all manipulations, except such as are absolutely necessary to determine the condition of the circulation, the respiration and the temperature must be avoided. Very rarely, indeed, attempts at artificial respiration may be justified, or friction of the limbs, the direction being always towards the trunk, may be admissible. In the main, however, our patient will be most benefited if let alone.

Regarding such measures as transfusion of blood, the course pursued must depend on in how great degree the symptoms are due to loss of blood alone; but, at best, I consider this means as of questionable utility. As regards the opposite expedient,—that of bloodletting,—it needs but to be mentioned to be condemned, notwithstanding the recommendation of Savory to open the external jugular!†

Of the various measures, then, at our command for treating a case of shock, whiskey and dry heat should first be employed; secondly, our case being at the outset very threatening, a full dose of strychnine should be given hypodermically,—say $\frac{1}{10}$ of a grain. Following this, digitalis and atropine may be used. Repetition must be guided by the deepening of the collapse.

In shock with restlessness and excitement,—that is, the so-called erethistic form—there is a strong temptation to the use of sedatives. No one, however, fully cognizant of the true nature of this state, can shut his eyes to their danger. The bromides, for instance, in small doses, are inefficient; in large doses, depressant. Chloral, on the other hand, may give us sleep, but it will be at the expense of still further weakening the heart. How is it, you ask, with opium? Travers, Savory, and Jordan each speak in favor of its use,—that is, with qualification. It is like a two-edged sword; it may in one instance quiet our patient, produce a restful sleep, and in another may overpower his already weakened nerve-centres. If used at all, it should be used in small doses, administered hypodermically, and repeated, if at all, with caution. On the whole, I regard it as a remedy rather to be avoided than courted. Travers speaks favorably of hyoscyamine, as does also Savory, and certainly this drug deserves a more extended trial.

I believe, however, that in the erethistic form of shock, in addition to the various measures employed in simple shock, we have no more valuable remedy than musk. Unfortunately, it can only with difficulty be obtained, much of that dispensed in its name being practically inert. However, should the remedy be at our command, it should be freely administered, in doses say of 15 grains, and preferably by the rectum. Its action in soothing, quieting, and steadying the nervous system is undoubted. Should musk be inaccessible, valerian might be employed, in large doses, of course, in its stead, but with much less promise of success. Better still, hops, in the form of the fluid extract, a drachm or more, may be administered.

You are to remember, however, above all things, that, as in the simple form of shock, needless interference with the patient is to be avoided, and that it is better to err in doing too little than attempting too much.

The individual judgment of the physician must always guide him in the selection of his remedies in any given case. Rest alone will in some cases in due time be followed by reaction. In others, again, a dose of whiskey, or, possibly, whiskey to which a small dose of morphine has been added, will give the most gratifying results. In others, still, the depression may be so great th

* There can be no doubt that in shock, as elsewhere, the inhalation of ether—*i.e.*, its cautious and sparing administration—acts very much as does alcohol, namely, as a stimulant. This is, I believe, in harmony with the experience of surgeons. Chloroform in shock is, of course, to be rigidly tabooed.

† *Loc. cit.*, p. 383.

the prompt application of external heat, and the various other powerful remedies already detailed, may be required. No fixed rule can be given; the indications must be met as they arise.

Let us suppose, now, that the stage of shock itself has been successfully combated. Let us suppose that our case has been one of railway shock in which the psychic element has played a prominent part, or that it is one of those cases in which powerful blows have been received upon the trunk or upon the back. We will remember at once how frequently psychic shock is attended by persistent sequelæ, not to speak of those more rare cases in which death itself follows after a time. Further, we recall the fact that permanent spinal symptoms, actual organic cord changes, may follow blows upon the trunk. What, then, shall be done, what measures shall we adopt, to meet these possibilities?

Evidently the state of rest must be prolonged,—prolonged far beyond the apparent needs of the patient's condition. All the time we should be on the alert for symptoms indicative of chronicity, and by all means in our power combat them. Surely the neurasthenia and the profound hysteria that occasionally ensue upon shock demand rest, and the sooner it is given them the better; and, in those cases in which shock of the cord is suspected,—in which, it may be, organic changes have been set up,—absolute rest is likewise indispensable. In other words, I believe that every case of railway shock, if at all severe, should at once be submitted to a rest-cure based upon the Weir Mitchell method. In such cases, whether mental or spinal, absolute rest, isolation from friends, forced feeding, massage and electricity should be the order of the day.

Even with these precautions cases in which the sequelæ are delayed would escape us; but "better late than never" should be our motto, and the rest-cure should be adopted whenever the sequelæ are detected.

The benefit of a careful watch over railway cases can be no better illustrated than those in which subsequent vertebral disease leads to paraplegia, and in which interference at an early day may avert this unfortunate result. This field, however, does not belong to to-day's discussion, and I merely mention it because it is not improbable that organic cord-changes dependent upon shock may be arrested, or at least delayed, by active measures taken in time.

The further consideration of this important subject, which can hardly be condensed into a brief address, and which I feel I have dealt with but imperfectly, I leave now to yourselves.

THE OPERATIVE TREATMENT OF SPINA BIFIDA.

By E. P. Hurd, M.D.

I.—CLINICAL REPORT.

Lumbo-Sacral Spina Bifida—Aspiration, then Excision of Sac—Ligature of Neck of Sac—Approximation of Deep and Superficial Parts with Catgut under Antisepsis—Recovery.

THE operation which I am about to describe is a sufficiently rare event in surgery to warrant me in giving the history of the case somewhat at length.

In September, 1888, Mrs. S. G. B., then residing in Concord, Mass., brought to my office her infant child, then 7 months old, to consult me with reference to a congenital swelling situated in the lumbo-sacral region. This tumor, entirely covered by the skin, which seemed normal, though at one spot thin and shiny and traversed by arborescent bluish veins, was then about the size of a large orange; it was situated exactly over the middle line of the trunk, was soft, elastic, fluctuating, was roundish, much the shape of a bowl, though slightly bulging, and terminating in a pyriform point on the left side. Here the skin was thin, as if in danger of bursting. This tumor seemed to be connected with the bony substance beneath by a large base, and could not be moved to either side from this attachment. Firm pressure failed to cause the least diminution in volume, nor did the cries or movements of the child in any degree change its size.

It was not possible by manipulation to detect any loss of substance in the vertebral arches, through which this swelling might have communication with the spinal canal. Directly over the central axis of the tumor was a thickened patch of skin. Had I duly weighed the importance of this sign, on which Duplay strongly insists, I could have had no doubt as to the diagnosis of meningo-myelocele. Virchow has shown that over the point of insertion of the caudal extremity of the cord there exists almost always a depression of the surface of the tumor, or a distinct patch, due to local thickening of its walls.*

* Duplay, "Leçons de Clinique Chirurgicale," Part II., 1879, p. 269.

The child, a girl, was well developed and strong; had never had any trouble of motility or sensibility; presented nowhere any discernible vice of conformation. The mother had had a normal pregnancy, and had always possessed fair health.

The diagnosis was somewhat obscure, but there seemed to me warrant for the opinion that this was a case of spina bifida, of the variety known as meningo-myelocele, with a very small foramen of communication with the spinal canal. With a hypodermic needle I drew off some of the liquid of the sac; it was clear and thin as water; did not coagulate under heat. One of the characteristics of the fluid of these hernial sacs is that it contains scarcely a trace of albumen, and a very minimum proportion of salts such as chloride of sodium and phosphates. On the other hand, it sometimes has a small quantity of urea or grape-sugar. It thus differs from all other secreted liquids. I was doubtful about the expediency of any operation except that of Morton, to which the parents did not then accede. I advised that a hollow truss of chamois leather be worn to support the tumor.

This case did not again come under my observation for several months. The parties meanwhile moved from Concord to West Newbury. During January, 1889, the little patient was again brought to my office. The tumor had increased somewhat in size, the bulging at the lower left inferior angle was still more marked. The subject of operative treatment was discussed, but nothing definite was decided upon.

An alcoholic sublimate lotion was prescribed to toughen the integument, and a well-padded chamois-leather-bag truss was adjusted to support the swelling. The tumor was becoming very inconvenient, besides being somewhat of a deformity.

September 4, 1889, I visited the little girl with my friend, Dr. G. W. Jones, of Cambridgeport, Mass. The tumor was then about the size of a quart bowl; it covered the sacral region as far down as the cleft of the buttocks. The child was then 17 months old, was able to walk and run, and seemed vigorous. Dr. Jones was inclined to regard the swelling as nothing but a simple cyst, entirely unconnected with the spinal cord or canal, and advised immediate removal.

It was arranged that the child should be brought to the Anna Jaques Hospital, Newburyport, on the 5th inst. It was decided that we should first aspirate the tumor, that we might the better determine its nature and the kind of operation to be performed.

September 6, the child was brought to the Anna Jaques Hospital. The swelling was aspirated in the most dependent portion, and all the liquid contents withdrawn; the whole amount was a pint and a half. The liquid was thin and as clear as spring water. At the place of puncture the skin was almost as thin as paper. The sac must inevitably soon have burst. The child became quite pale and weak from removal of so much fluid, but manifested no particular restlessness. In half an hour she took her bottle with the usual avidity, and seemed fast rallying.

After collapse of the sac, an examination was made. There was nothing to indicate that the swelling was necessarily anything but a simple cyst, and it was decided to cut down on the sac and dissect it out. The parents, with much hesitation, gave their consent.

Ether was administered, and a linear incision made over the tumor, freely exposing the inside of the sac. To my consternation I saw the nerves forming the cauda equina spread over the surface of the white, shiny membrane constituting the sac, and, passing my finger along this membrane, it sank into an indentation caused by a loss of substance in the arch of the last lumbar vertebra; the spinous process, in fact, seemed to be absent. A small foramen was visible at this point, and a probe was easily passed through it into the spinal canal.

I was too familiar with Gross's condemnation of operative interference in cases of true spina bifida to have courage to continue an exsection which might end in the death of my patient, and bring upon me the lasting reproach of a whole family, so much attached to the child. Besides, I fancied that I saw a menace of convulsions and sinking. We hastily removed a considerable portion of the surplus integument with the sac, and brought the edges of our incision together with a continuous catgut suture, over the whole painting flexible collodion. A compress and bandage were next applied, and the child was allowed to come out from the influence of the anæsthetic.

Tuesday, September 10, I was hastily summoned to the house on Boardman Street, where Mrs. B. was stopping with her child. The report that came to me was that the sac had refilled and had burst. Apparently about a pint of liquid had drained away through a loss of continuity, due to a giving way of

of the catgut stitches. The child was somewhat pale and weak; otherwise had sustained no harm.

A consultation was held with Dr. G. W. Jones, and it was decided that there was now nothing to do but complete the operation which we had commenced on the 6th. It was certain that the sac would keep on secreting, and that we could not stop its leaking. This would soon enfeeble the child beyond the ability to rally. The injection of an irritating liquid (like Morton's solution) seemed to offer a forlorn hope by the side of a more radical operation which should remove the secreting membrane, and close up the wound in such a way that perfect soldering together of the raw surfaces—the deep and superficial parts—would be inevitable.

The case was submitted to the parents, who were made to understand that in our judgment there was no other operation which gave a reasonable hope of saving their child's life. If they were disposed to blame me for the incision of the previous day (Friday), which had now put their child's life in such jeopardy, they should bear in mind that the inevitable tendency of the case, as it had been progressing for many months, was towards sloughing and rupture, and the thinness of the sac at its most dependent portion showed that this event must soon have taken place.

The consent of the parents was readily obtained to the operation upon which we were now decided.

Wednesday, September 11. Ether was administered, and the operation was performed under thorough antiseptic precautions. Once during the operation it was deemed necessary to rally the failing heart by a hypodermic injection of ether. The line of incision made on Friday was opened up, and the cavity sponged out with a sublimate solution (1–2000). The glistening sac, with its arborescent nerve-filaments and median core, was dissected or torn from its subjacent tissues, till we had the entire membrane in our hands down to the foramen of entrance into the vertebral canal. Behind the neck of the sac (and by this term I mean the constricted portion before mentioned, where the sac passed up into the spinal canal) was a large pulsating artery, which we carefully avoided. A stout catgut ligature, which had been previously well chromicized to make it more enduring, was passed around the neck of the sac and twice firmly tied, then the entire sac was excised; iodoform was freely dusted over the raw surfaces, and a continuous fine catgut suture was taken, attaching the deep layer of the skin in front to the fascia which had constituted the posterior boundary of the sac; this running blind-stitch was entered from above and below till it finally ended in the edges of the cutaneous flaps, which were also brought together by a buried catgut suture; iodoform was applied once more, and the line of incision finally closed in with flexible collodion. A compress and bandage completed the operation. Dr. G. W. Jones rendered me most important assistance by his superior surgical tact.

It will be seen that the above was strictly a hernia operation, performed according to Marcy's methods, as described in his recent treatise on "The Radical Cure of Hernia,"* published by G. S. Davis, Detroit. The sac with its contents originally belonged to the spinal canal, and had become a hernia by protrusion through a weak place in the last lumbar arch. This foramen of exit corresponded to the abdominal ring which gives passage to intestinal hernia.

The ligature of the sac by chromicized catgut is according to Marcy's plan of dealing with the sac of abdominal hernia, and the stitching of the deep and superficial parts together by a running catgut thread, and the final closure of the cutaneous incision with catgut and collodion is also like the abdominal operation.

The subsequent progress of the case has been most gratifying. To-day (September 16), the sixth day after the operation, the wound is fast healing, and the child has nearly recovered its strength. At the former site of the sac, where the bulging was greatest, there is now a cup-shaped concavity, and the foramen of exit seems filled by plastic exudation. All inflammatory action has subsided. The child was restless during the first two or three days. This restlessness was calmed by the free administration of wine and 5-grain doses of sulphonal at night; the latter produced quiet sleep. I should have remarked that the operation was immediately followed by considerable collapse, which, however, soon subsided under brandy and external heat.

With regard to the large quantity of liquid abstracted from the sac (certainly more than a quart in less than a week), I cannot think that this was chiefly cerebro-spinal fluid, but rather a secretion from the sac itself. This

* "The Radical Cure of Hernia," Leisure Library Series, 1888, G. S. Davis, Detroit.

was proved by the rapid refilling of the sac after aspiration. The quantity of cerebro-spinal fluid in the cavity of the arachnoid in the normal state is but a few ounces.

II.—GENERAL CONSIDERATIONS ON HYDRORACHITIS.

According to the report of the London Committee on Spina Bifida (1885), the term "spina bifida" is used to define certain congenital malformations of the vertebral canal with protrusion of some of its contents in the form of a fluid tumor. With very rare exceptions, the malformation affects the neural arches of the vertebræ, and the tumor projects posteriorly. Three varieties are given: 1. Protrusion of membranes only (simple meningocele); 2. Protrusion of the membranes, together with the spinal cord and its appertaining nerves (meningo-myelocele); 3. Protrusion of the membranes, together with the spinal cord, the central cavity of which is dilated so as to form the sac cavity, the innermost lining being constituted by the expanded and atrophied substance of the cord (syringo-myelocele). Meningo-myelocele is far the most frequent, while simple meningocele comes next, and syringo-myelocele comes last.

Spina bifida is a rare condition, about one child in fifteen hundred (some authorities put the figure as high as three thousand) being born with this defect.

The committee state that in the ordinary form of spina bifida (meningo-myelocele) the spinal cord traverses the wall of the sac unchanged, giving off its nerves regularly as it lies in the sac wall.

They conclude that there is an absence in the walls of the tumor of the mesoblastic tissues, and accept Morgagni's theory that the deformity is due to lack of development of this embryonic tissue.

What may be the cause of this arrest of development, and what may be the pathological process under the influence of which it is produced, is not known.

In a practice of twenty-five years, I have never seen but three or four cases of this formidable disease. Some years ago I was called to see a case with Dr. J. J. Healy, in which the tumor was in the lower cervical region; it was of large volume,—as nearly as I can remember, about the size of both fists closed,—there was absence of several of the neural arches, and the hernial sac protruded through a cleft in the middle line. This sac was entirely uncovered by skin, and its contents could be diminished by pressure towards the spinal opening, or increased by the position and movements of the child. The unfortunate subject of this malformation lived but a few days.

III.—OPERATIVE INTERFERENCE.

Excision of the Sac.—The older surgeons do not appear to have been so much afraid of a cutting operation as many of their modern successors are. The operative procedure to which we resorted in the case above reported was in principle that adopted and practised successfully by Dubourg more than fifty years ago, though not with catgut and antisepsis. The swelling was cut through with a straight knife, the sac was dissected out and tied at the neck, then cut off, and the cutaneous flaps, after much redundancy of skin was removed, were brought together in the middle line and united by three or four hare-lip pins and the twisted suture.* This operation, says Chelius, is required when the swelling and opening are of small size and the child's health otherwise good.

Gross† unqualifiedly condemns all cutting operations. "Hydrorachitis," he affirms, "is one of the most fatal of diseases. Few children survive their birth longer than five or six months, . . . death being caused, either by convulsions or by ulceration of the sac and the sudden escape of its contents. . . . If the tumor be opened after birth, either accidentally or designedly, death usually follows in a few hours, the immediate cause of dissolution being convulsions from the pressure being taken off the brain in consequence of the loss of the cephalo-spinal fluid. . . . It may be regarded as of a more hopeless character when it affects the cervical region than when it is seated in the dorsal, lumbar, or sacral."

As for treatment, he favors "constant pressure with collodion" and a "common roller with a cup-shaped truss lined with a thin air-cushion, so as to diffuse the pressure equally over the entire swelling." He advises that the compression should be aided by the occasional evacuation of the contents of the sac by subcutaneous puncture with a fine trocar or bistoury. "Only a portion of the fluid should be drawn off at a time; if the whole

* *Journal de Médecine et Chirurgie de Toulouse*, September, 1839. "Chelius's Surgery," vol. iii. (1847) p. 189. Still older authorities condemn all operative interference. See Cooper's "Dictionary of Surgery," 1820, article "Spina Bifida."

† "System of Surgery," vol. iii. (1862) p. 266.

be removed at once convulsions will be inevitable, and the child will perish in a few hours." He remarks that "Benjamin Bell and other surgeons have suggested tying the base of the sac with a ligature, with a view of removing the tumor, and preventing further propulsion of the spinal membranes; but the results which have been published in favor of the operation are not such as to warrant a repetition of it." He adds that, in all the cases of which he has had knowledge, the effects have been most lamentable, the patient dying either immediately after the operation from convulsions, or a short time afterwards from an extension of the inflammation to the spinal cord and its envelopes. "The same may be said of the operation of excision after ligation of the pedicle [neck of sac], and the application of the actual or potential cautery for the purpose of exciting adhesion between the opposing surfaces of the sac. All such procedures cannot be too pointedly condemned, as being both unscientific and certain to prove fatal."

He adds that "the only case in which ligation can ever be proper is where the sac has an uncommonly narrow pedicle, with an exceedingly small aperture of communication, but even under such circumstances, which are extremely infrequent, the safer practice unquestionably would be systematic compression in union with occasional puncture."

With this judgment I understand Wyeth* substantially to agree. He favors "the palliative treatment of spina bifida," which consists in moderate compression over the tumor, to be followed out for one or two years, *unless more radical measures* are indicated by the failure of this method to arrest or greatly retard the growth of the swelling. The only "radical measures," however, which he suggests are drawing off a small quantity of fluid (℥i to ℥i) by the aspirator, the smallest needle being used, and the contents slowly evacuated. He favors Morton's method of iodo-glycerin injection when the tumor is well pedunculated, and the communication between the sac and membranes of the cord is not large. When the communication between the sac and spinal cord is wide, and the tumor is sessile, he believes all operative interference to be contraindicated.

Druitt† takes essentially the same view. "We read," he says, "of cases in which the tumor has been cut off and the edges united by twisted suture, or in which it has been included in a ligature and tightly tied; but these plans will not be readily adopted by any one who would rather not open the spinal membranes or injure the *cauda equina*. The operation of puncture, too, is generally followed by speedily fatal results." He advises "moderate support by means of a hollow truss."

Duplay (*loc. cit.* p. 273) coincides with the above-named authorities,—"Il faut bien se garder d'attaquer la tumeur par les moyens chirurgicaux. Il faut laisser à la nature le soin de la guérison." He suggests compression by collodion (painted over the tumor), and the occasional puncture of the tumor and evacuation of a small amount of liquid, a capillary trocar being employed. This method, he says, is not free from danger; Giralde's statistics show that twelve out of twenty-two children died from puncture; and, moreover, it does not do much good, as the sac rapidly fills up again. He condemns Morton's method, cauterization, excision, the simple ligature, the elastic ligature, yet adds that the ligature may be applicable to cases where the spinal aperture is obliterated or very small.

Finally, Guersant ("Surgical Diseases of Infants and Children:" H. C. Lea & Co., Philadelphia, 1873), after painful experience with the cutting operations, condemns them: "We have had occasion to perform this operation three times in the lumbar region, an elliptical incision being made over the tumor, the finger at once being placed over the opening to prevent the entrance of air, and the wound united by the twisted suture." Guersant's three patients "died of spinal meningitis with pus and flakes in the vertebral canal."

Before closing the argument against surgical interference, this is the proper place to mention the fact that the committee appointed in 1885 by the Clinical Society of London to investigate the treatment of spina bifida, discountenance any radical operation that proposes the removal of the sac or the median vertical portion into which the cord is ordinarily inserted, and are agreed that the treatment by Morton's solution is by all odds the safest.‡ "Ligature of the sac was considered, and here good results seem to have been obtained. Excision likewise had a con-

* "Text-Book on Surgery," New York, 1887.

† "Principles and Practice of Modern Surgery," Lea Brothers & Co., Philadelphia.

‡ *Boston Medical and Surgical Journal*, July 2, 1885, p. 42; *British Medical Journal*, May 30, 1885, p. 1098; *Lancet*, May 30, 1885, p. 989.

siderable proportion of success. The plan of repeated tapping and pressure gave the least successful results of any. The injection of Morton's fluid showed a percentage of success of between fifty and sixty. . . . In spite of the favorable results of ligature and excision of the tumor, as shown in the tables, the committee felt themselves compelled to report against these methods of treatment."

COMMENTS.

1. There is no doubt that cutting operations should be limited to cases where the pedicle (or neck of the hernia) is small, and where the opening into the vertebral canal is small. The opening, in the case above reported, would barely admit the little finger, or, viewed from the interior of the sac, it would only admit a good-sized probe or director. Again, there can but be unanimity in the judgment that hydrorachitis with a large pedicle and a large foramen of exit is not suitable for a radical operation, though even here such operation may exceptionally succeed ; nor are those cases suitable that are not completely covered with integument, or are situated in the cervical region.

2. That, however, cases of lumbo-sacral or sacral spina bifida, similar to the one above described, may be with safety treated by a radical operation which shall involve extirpation of the sac and its nerves, if done antiseptically and with care, has been proved again and again.

3. It is admitted that surgical operations with perfect asepsis are much more likely to be a success than operations without antiseptic precautions. It is presumable that the frequent failures of the older surgeons in the operative treatment of spina bifida, as in laparotomy, joint surgery, etc., may have been in part due to the supervention of a complication which the modern surgeon excludes by his rigorous prophylactic means,—viz., septic poisoning. It has been demonstrated that important cavities—the thorax, the abdomen, the large joints, the spinal canal, the encephalon, etc.—may now be opened with impunity, lesions treated, morbid growths removed, and the wound duly closed, and no suppuration or other untoward symptom shall follow. Herniotomy, and operations for the radical cure of hernia, have now become almost absolutely safe, thanks to iodoform, phenic acid, and corrosive sublimate. It will be observed that Guersant's three patients (*vide supra*) "died from spinal meningitis, with pus and flakes in the vertebral canal." Would this result have followed if Guersant had done his operations aseptically? When Gross tells us that cases which had come within his knowledge died shortly after the operation "from extension of the inflammation to the cord and its envelopes," we can but ask, Was this extension a reverberation of the traumatic inflammation, or was it a septic inflammation, due to the introduction of morbid germs by the wound?

Is it not probable that with cleanliness, asepsis, and perfect closure of the wound, the apprehended danger of extension of an inflammation from traumatism is a figment and a bugaboo?

It must be borne in mind, moreover, that there is a wide difference, as far as the danger of septic accidents is concerned, between wounds closed according to the old methods, and wounds closed by antiseptic catgut. Even the ligature of the sac is a far simpler and safer thing when done with chromicized catgut than when done with a material that has not been sterilized. I can well conceive that the success of an operation might be compromised by using a ligature that was not thoroughly aseptic.

4. "If," says Gross, "the tumor (spina bifida) be opened, death usually follows . . . in consequence of the loss of cerebro-spinal fluid."

If death *did* usually follow a simple incision, of course no cutting operation for this disease would ever be thought of. It would appear that Gross, Duplay, and other surgeons who have given expression to the same opinion have generalized from too limited a number of really typical cases. That some rhachidian hernias are attended with this result is undoubtedly true. This is especially likely to be the case where the foramen of communication is large, and where by pressure most of the fluid can be forced into the spinal canal. But in the typical lumbo-sacral tumor (like that which I have described), once or twice drawing off all the sac contents may not be attended with any serious harm.

In fact, it is doubtful whether in the typical hydrorachitis the liquid contained in the sac be the cerebro-spinal fluid. It is worthy of note that in Professor Humphrey's able lecture "On the Anatomy of Spina Bifida," the view which he entertains is that the sac is most frequently formed from the subarachnoid space, thus being shut off from the dangerous arachnoid cavity:* "The sac of the spina bifida appears

* *Lancet*, March 28, 1885, p. 557.

to be formed in the subarachnoid space, and the lining of the sac, as well as the coverings of the cord and of the nerves, . . . must in that case be formed by the subarachnoid or pia mater tissue. It is not always easy to determine, even on dissection, whether the sac of the spina bifida is thus separate from the arachnoid cavity; but, when it is so, the fluid in the sac, and, in like manner, any fluid injected into the sac, will not readily pass into and along the arachnoid cavity and the skull."

In my own patient it seemed to me more probable that the sac secreted (in large part or wholly) its own fluid than that this came from the great arachnoid cavity or the spinal canal. I am perfectly certain that the sudden withdrawal, in one instance of nearly a quart, in another of fully a pint, of cerebro-spinal fluid, would have been followed by a speedily fatal result.*

5. It is probable that Druitt, Duplay, and other surgeons have attributed too much importance to the nerves that in typical spina bifida are spread out over the inside of the sac. Certain it is that cases are now sufficiently numerous where the nerves constituting the cauda equina have been removed with the sac in spinal hernia, with no untoward results following.

6. Clinical experience is proving that the fears expressed by the older surgeons, and by many modern surgeons, respecting operative interference of the more radical sort, such as is implied in the exsection of the sac, or the obliteration of its aperture of communication with the cord, are, if not altogether unfounded, at least exaggerated. At a meeting of the Clinical Society of London, March 27, 1885,† Mayo Robson, of Leeds, read a paper "On a Series of Cases of Spina Bifida treated by Plastic Operation." One of Robson's cases was a female child, 8 days old, puny, ill-developed, with a large spina bifida in the lumbar region. The sac was all excised, "except two narrow portions, which were sufficient to form meningeal flaps, these being covered in by skin flaps obtained by separation and sliding from the lumbar region." The wound healed by first intention. The child afterwards died from marasmus. At the autopsy "the whole lumbar spine and part of the sacrum were bifid."

In another case (an adult) the sac was inflamed and suppurating. Robson excised it by a crucial incision through the skin; the cavity was drained for a few days: recovery.

Another case (patient aged 7 years) was a large spina bifida of the lumbar region. Skin was dissected from sac, and redundant sac and integument removed; suture of meninges by catgut and of skin by wire. Union took place by first intention. "All the operations were done antiseptically, eucalyptus atmosphere being used instead of the spray."

By several successes Robson has demonstrated,—1, the possibility of transplanting periosteum and its capability of surviving; 2, the possibility of attaining a cure by a plastic operation in cases not amenable to any other treatment,—*e.g.*, where the coverings are thin, or the opening into the spinal canal large; 3, the possibility of performing the operation successfully, without immediate closure of the wound,—*i.e.*, where drainage is for several days maintained.

Edward Atkinson, one of Mayo Robson's colleagues at the Leeds Infirmary, has performed an operation very similar to the one which I have reported. In this case the sac communicated with the spinal canal by means of a small opening. Atkinson dissected off the skin, exposed the neck of the sac, ligatured it by means of one circular ligature, cut off the redundant meninges, and brought the skin over so as to have the line of skin sutures quite at the side, away from the pedicle.

Mr. Robson thinks that when the spinal cord or the nerves are blended with the sac, it is better to excise portions of the redundant meninges at one or more places between the nerves, to replace the nervous structures in the spinal canal, and bring over the skin-cover; free drainage should be kept up between the membranes and integuments, and a silver or leather shield worn over the site of the operation in order to protect the parts from injury, and to prevent the cicatrix from stretching or giving way.

In the *Lancet* for July 26, 1884, Dr. Robt. Howson reports a case of excision of a lumbar spina bifida in a child 14 days old; he closed the neck of the sac with a clamp; the case ended in recovery.

In the *Giornale di Clinica e Terepia* (*Lancet*, May 17, 1884) Dr. Antonino Turretta reports a case of spina bifida successfully treated by the elastic ligature: "The tumor was as large as an apple, in the middle line, opposite the two last cervical vertebræ." The ligature,

* According to Professor Ranke, of Munich, the arachnoid (from which the sac is originally derived) is a secretory organ of considerable energy.

† *Lancet*, April 4, 1885.

with the tumor, separated on the twelfth day, leaving a granulated surface, which gradually contracted.

At the Royal Medical and Chirurgical Society, January 22, 1884,* Dr. Walter Whitehead, of Manchester, showed a case of spina bifida cured by operation. The patient was a married woman, aged 29. The tumor was first tapped, then treated by the actual cautery, which was freely applied to the entire surface and circumference of the tumor. In four days the contents of the sac were ascertained by aspiration to be puriform; in the fifth, the sac was laid open and the case treated to its termination by ordinary dressing.

In the *Medical Record*, June 16, 1883, Dr. Robt. T. Hayes, of Rochester, N. Y., reports "a successful operation for spina bifida after the method of Mr. Robson, of Leeds, England. A portion only of the fluid in the tumor was removed before the incision "as a guide to the degree of tolerance present for such a procedure." The skin was then incised and dissected back. The sac was freely opened, the superfluous portion of the membranes removed, and union formed by six interrupted catgut sutures. Some twenty periosteal grafts from the fresh periosteum of a rabbit were inserted on the surface of the membranes, and the external flaps hastily trimmed and closed. The grafts took well, and the operation proved a success.

This operation is similar to one performed by Mr. Robson (*British Medical Journal*, December 30, 1882) on a child 6 weeks old. After removal of the redundant parts, and after stitching up the arachnoid over the spinal canal, periosteum from a rabbit was inserted between the meninges and the skin, so as to cover the gap in the bones. The case was successful. Mr. Robson drew attention to the following points (*Report to the Medico-Chirur. Society*): 1, the operation was performed with full antiseptic precautions, eucalyptus air being used instead of carbolic spray; 2, the meninges were closed by uniting the serous surfaces, as in peritoneal surgery; 3, the transplantation of living periosteum and its continued vitality; it had not yet, however, formed new bone, but already the covering of the canal had a greater than mere skin firmness; 4, the entire absence of bad symptoms in the child operated upon at so early an age was noticed.

In the *Glasgow Medical Journal*, November, 1871, appears the report of an interesting case by Dr. John Wilson, where a spina bifida of the upper dorsal region, in a child 2 weeks old, was treated by free incision, the wound being kept open, but dressed antiseptically. By the free incision, instead of small punctures which might soon close, he hoped to prevent the possibility of the cavity being even partially distended in the future, while at the same time by the antiseptic to obviate all danger of inflammatory disturbance of the cord or its membranes; the ultimate object being to secure complete obliteration of the cavity and the formation of a firm pad over the void in the vertebral column. The plan was duly carried out and with gratifying results.†

In the *Medical Record*, August 2, 1879, appears the report of a case of lumbar spina bifida treated successfully by the application of a stout silk ligature around the pedicle; the contents of sac were then evacuated by a free incision. In eight or ten days the dead mass dropped off, and the stump kindly healed without any further trouble.

In the *Lancet*, October 2, 1886, Dr. John Kellock Barton reports a case of spina bifida in the lumbar region successfully treated by excision. From the fact that no paralysis existed either of the sphincters or lower limbs, Dr. Barton believed this to be a meningocele and not a myelocele. In ten days the child was discharged cured; it subsequently died in a fit of convulsions. Dr. Barton thinks that the convulsive attack must be regarded as a sequel of the operation. Dr. R. W. Parker, in commenting on this case in the *Lancet* for November 20, 1886, declares that freedom from paralysis is not a diagnostic point between meningocele and myelocele. Dr. Barton had stated that in the case on which he operated numerous small nerves passed into the portion removed, which were, of course, cut across. Dr. Parker (who, by the way, wrote the article on "Spina Bifida" in "Heath's Dictionary of Surgery") assures Dr. Barton "that the nerves found within the sac do not pass into the sac wall, but that they arise from it; and that the median vertical portion of such a spina bifida as he describes represents the spinal cord, in fact, is the spinal cord modified by the pressure to which it has been subjected. Mr. Barton's operation was, therefore, equivalent to removal of a portion of the spinal cord. Under such circumstances, ultimate success was im-

* *Lancet*, January 26, 1884.

† *Br. Ret.*, Part 65, p. 137.

possible." He, therefore, dissuades all surgeons from following Dr. Barton's example.

It will be seen from the above citations that quite a variety of operations have been performed,—from excision of the sac without ligature to ligature without excision; from operations followed by perfect closure of the wound to operations in which the wound was left open to drain and granulate. In some the sac was removed in its entirety, in some it was cauterized, and in some it was removed only in part; in some the cauda equina was respected, and in some it was excised with the sac. After reviewing all this surgical literature, I am satisfied that for cases like that of my own patient the operation which I performed is the most rational and feasible.

IV. TREATMENT OF SPINA BIFIDA BY INJECTIONS.

The use of injections for the cure of spina bifida was first suggested by Dr. Brainard, of Chicago, in 1848. His formula is:

℞ Iodinii, gr. ¼ to v;
Potas. iodidi, gr. ¼ to xv;
Distilled water, ʒi. M.
Sig.—Use about ʒss for each injection.

The rules for its use are:

1. Make the puncture subcutaneously in the sound skin by the side of the tumor.

2. Draw off no more serum than the quantity to be injected.

3. Apply pressure during the operation so that none of the solution shall enter the spinal canal.

4. If symptoms of irritation appear, draw off all the contents of the sac and replace them with distilled water.

After the operation the patient should lie on his side, and, if there is much heat, evaporating lotions to the part are required. As soon as the tumor becomes flaccid it should be covered with collodion, or supported by pressure. The injection should be repeated as often as necessary, care being taken that previous irritation has completely subsided.*

Professor James Morton's injection-fluid has glycerin for its menstruum:

℞ Iodinii, gr. x;
Potassii iodidi, gr. xxx;
Glycerinæ, fʒi. M.

It was thought that, as this fluid is less diffusible than either a spirituous or watery solution, it will be found less likely to permeate the cerebro-spinal fluid with rapidity, and so cause shock or bring on convulsions.

According to the London committee's tables (*vide supra*), the injection of Morton's fluid showed a percentage of success higher than all other operative measures,—between fifty and sixty per cent.

Of the seven cases treated by Brainard before the publication of his paper† in 1861, in three only was there a permanent and complete recovery. Dr. Morton states, in one of his earlier reports, that of the fifteen cases treated by his method, twelve were successful and three fatal, and that all his own lumbar cases have hitherto been fortunate.

In successful cases treated by Morton's method, the tumor soon shrivels up and becomes flat. In some of his cases only one injection was required.

The rules for the injection of Morton's fluid are similar to those given by Brainard. A small quantity of fluid is withdrawn, and about half a drachm of the iodo-glycerin solution is injected. The puncture is sealed with collodion. Pressure is applied. When the sac refills, the injection is repeated.

Medical literature for the past ten years has abounded in reports of cases where Morton's method has been tried. The London committee seem to have been justified in their favorable recommendation. They advise a careful selection of cases, and urge that it is foolish to practise these injections when, from the presence of grave marasmus, or a marked condition of hydrocephalus, even the cure of the spina bifida would not offer a chance of materially benefiting the patient.

The treatment certainly commends itself for its simplicity and ease of application. As to the mode of action of the iodo-glycerin injection little is definitely known.

POSTSCRIPT NOTE (September 26, 1889).—This is the sixteenth day since the operation described under the head "Clinical Report." The child is well—has full use of all her members. There have been no nervous or other untoward symptoms since the memorandum made on the 16th inst. The wound is almost healed; the line of incision, in which remains of the catgut can still be seen, is marked by a firm cicatrix. A rather thin but solid plastic exudation covers in the site of the former sac and the solution of continuity in the vertebral column.

The result of this case has proved two

* Napheys's "Surgical Therapeutics," 1882, p. 235.

† Napheys, *loc. cit.*

things,—(1) the loss of the fluid contents of the sac in a lumbo-sacral spina bifida is not necessarily a serious matter; (2) the cauda equina is of no special consequence in the economy, and may be removed with impunity when part of a spinal hernia.

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*FURTHER OBSERVATIONS UPON BETA-NAPHTHOL.**

By John V. Shoemaker, A.M., M.D.,
Philadelphia, Pa.†

THE chemistry and physiological action of beta-naphthol has been described by me in investigations and published papers since 1883. In October of the latter year I read a paper on beta-naphthol‡ before the Philadelphia County Medical Society, and in a series of experiments upon animals and several students I pointed out that it was a most valuable antiseptic agent. In addition, I also demonstrated that beta-naphthol, given internally, produced great warmth in the epigastric region after each dose, which passed away in a short time, but left my students with slight vertigo, buzzing in the ears, and with all evidences of cerebral hyperæmia. The alvine evacuations were softened and of a mushy consistence, changed to a clay color, and in one of the cases increased to a diarrhœa. The cerebral symptoms just related were not constant, and only followed after the beta-naphthol had been given in very large and increasing doses. At various times during the past six years I repeated the above experiments upon myself and others with similar results.

Beta-naphthol, on which I have made the observations just related, is a derivative of naphthaline or coal tar. In its state of purity it occurs in silver crystalline scales which can be easily powdered. An impure form of beta-naphthol is now offered to the profession which has been erroneously termed hydro-naphthol. From the researches of Merck, Jacobson, Bouchard, Hoffmann, Endemann, Genois, and myself,§ it has been conclusively shown that, barring the impurity of hydro-naphthol, the difference in chemical constitution between it and beta-naphthol is *nil.* Hydro-naphthol exists only as an impure form of beta-naphthol, and it has been so demonstrated by some of the most distinguished chemists of the day. Hydro-naphthol is, therefore, as I have already shown in a previous paper,‖ a quasi-proprietary preparation, Genois stating very clearly that alpha- and beta-naphthols are the only possible naphthols. Pure beta-naphthol is inodorous and pungent to the taste. It possesses stimulating and slight sedative action applied to the integument or to the mucous membrane. It is soluble in alcohol, ether, fixed oils, and but slightly soluble in water. It has been shown to be dissolved in five hundred and twenty parts of water at 60° F., and in seventy five parts of boiling water.

Therapeutics.—Continued observation has convinced the writer that beta-naphthol is one of the best and most valuable non-poisonous antiseptic agents at our disposal. In pharyngitis, chronic nasal catarrh, hay asthma, whooping cough, and chronic bronchitis beta-naphthol inhalations are of much utility. The beta-naphthol doubtlessly through these inhalations destroys minute organisms should any exist. In gastric disorders, especially in nausea and vomiting from an irritable condition of the stomach-nerves, much benefit follows from beta-naphthol. Good results have also been produced by beta-naphthol in intestinal catarrh depending upon septic changes. Dr. Comby at the Paris Clinical Society recently reported the greatest benefit from beta-naphthol in gastric and intestinal disorders. A writer from Paris in the *Journal of the American Medical Association*, May 25th, not only confirms these views, but also adds that, "According to Dr. Comby's experience, naphthol is an inoffensive medicament, and may be employed for some time without any inconvenience, and he can only corroborate the observations of Professor Bouchard, who stated that intestinal antisepsy in general, and antisepsy by naphthol in particular, should be practised in all these

* Prepared for the meeting of the Medical Society of the State of Pennsylvania, which was to have been held at Pittsburg, Pa., June 6, 1889. The Society adjourned without taking up addresses and papers, on account of the Johnstown flood, until June, 1890.

† Professor of Materia Medica, Pharmacology, Therapeutics, and of Clinical Medicine, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia.

‡ See paper by the author, "Naphthol, its Medicinal Uses and Value" (*Journal of the American Medical Association*, October, 1883).

§ See paper by the author, "The Imputations on Beta-Naphthol" (*Journal of the American Medical Association*, July 14, 1888).

‖ See paper by the author, "The Beta-Naphthol *vs.* Hydro-Naphthol Contention" (*Journal of the American Medical Association*, May 11, 1889).

morbid states which, as for instance gastric disorders, appear to depend on abnormal putrefactions which occur in the digestive tube." The *Jour. de Méd. Prat.* likewise states that Professor Dujardin-Beaumetz has used beta-naphthol with much success in treating secondary fermentation in the stomach and intestine in cases of severe flatulent dyspepsia; also in chronic cases of stomach dilatation from analogous causes. The following combination* he is said to employ: Beta-naphthol, salicylate of bismuth, and calcined magnesia, āā 10 gm. (150 grs.); divide in thirty cachets; one before each of the two principal meals.

One year ago I spoke of the advantage of employing beta-naphthol in obstinate constipation. In some cases of constipation depending upon digestive disturbance, it acts well in from ½- to 3-grain doses three to four times a day. The hard, lumpy evacuations often attendant upon such cases become softened, of a mushy consistence, and may change to a clay color.

Beta-naphthol, on account of its antiseptic effect, is of great value, and may be employed in diphtheria, erysipelas, malarial, scarlet, and in typhoid fevers. Since my original observation upon its internal administration Dr. J. Mitchell Bruce reports also its efficiency in enteric fever,† in which he recommends the following formula:

℞ Beta-naphthol, gr. xx;
Tr. aurantii, f℥ii;
Syr. limonis, f℥ss;
Mucil. tragacanth., f℥iii;
Aquam, ad f℥vi. M.
Sig.—Dose, one ounce.

The same writer also deduces these conclusions for the employment of this useful antiseptic:

1. That the production of intestinal antisepsis is a rational mode of treatment of enteric fever, and that beta-naphthol is a safe and tolerably efficient agent for this end.

2. That by its use in the cases referred to the duration of the disease was shortened, and the intensity of the symptoms directly arising from profound disturbance in the alimentary canal was lessened.

3. That the tendency to the occurrence of splenic enlargement, albuminuria, and of secondary complications, such as boils, abscesses, etc., of purulent infective origin, is diminished.

4. That complete convalescence is more speedily and satisfactorily attained, and that there is less risk of propagation of the disease to others.

Delafield also recognizes the utility of beta-naphthol, and advises it in the treatment of diarrhœa in typhoid fever of infants. He adds, in writing‡ of its administration, "If the diarrhœa be somewhat profuse, give ℞ Naphthol, salicylate of bismuth, āā. 40 gr. Divide into ten papers, one of which should be administered about every hour, either in unleavened bread, a little milk, or a spoonful of Todd's potion. Given thus, the medicine is easily borne and taken without repugnance. If the diarrhœa be moderate, use the naphthol alone, in the following manner: ℞ Naphthol, 40 gr. Divide into ten powders, one every hour. Finally, if there be a tendency to constipation, add to the naphthol a little salicylate of magnesium."

Professor M. Bouchard, of Paris, has beyond all question made the most extensive scientific research upon beta naphthol. From his numerous experiments he regards beta-naphthol as being one of the best of all antiseptic agents employed. In the course of a series of experiments recently made by M. Bouchard and reported (*British Medical Journal*), he concludes that, if intestinal putrefaction plays so important a part in pathology, it is necessary to endeavor to diminish its intensity. This is attempted by the administration to patients of insoluble antiseptics. The disinfectants, in this view, need to be insoluble in order that they may make the passage from one end of the intestine to the other. Nor must they be poisonous, since they are to be taken in large doses. Naphthol is pointed out as best fulfilling these indications. M. Bouchard employs it in various diseases, and particularly in typhoid fever. Under the influence of this drug he finds that the stools are completely deodorized, meteorism is lessened, the tongue is moist, delirium rare. He adds to this treatment the administration of baths of progressively low temperature. A special bath service is provided in his division of the Hospital Lariboisière. Under the influence of this treatment he records a notably diminished mortality, not more than 11.7 per cent., while in the other services of the same hospital it oscillates around 20 per cent.

Dr. John Aulde, of Philadelphia, also writes as follows concerning this drug:

* *Jour. de Méd.*, April, 1889.

† *London Practitioner*, December, 1888.

‡ *The Medical Waif*, May, 1889.

"While my experience with the use of the beta-naphthol has not been very extended, clinical observations warrant the statement that it is a superior remedy for the treatment of all bowel affections in which there is reason to believe that the disease may be due to the presence of micro-organisms, or to the ferments which they produce. Being a firm believer in the conservative processes of nature, I cannot overlook the presence of phagocytes and the relations they bear to the bacteria, and in all cases of typhoid, in diarrhœa and dysentery, and other instances in which we desire the aid of a suitable germicide, naphthol will eventually occupy a high place in the estimation of the clinician. My plan of administering it in the cases mentioned will be understood when it is stated that the best results have followed its exhibition in small doses,—not more than ½ grain to 1 grain every hour or two. For children, ½ grain every two hours is quite sufficient to produce all that can be expected from the use of naphthol, but it must be continued faithfully during a sufficient length of time to effect some change in the condition of the patient, and especially is this true in the treatment of typhoid fever.

"One of the greatest difficulties in using this drug, as well as in the use of many others which are disagreeable to the taste and require to be administered in pill form, is that we are not always certain of the solubility of the preparation. This remark is prompted from the fact that quite recently, in the case of a child with dysentery, the mother told me the second day after the naphthol was ordered that the pills were passed as they had been taken, and nearly all of them were recovered from the stools. This accident can be avoided, I think, by preparing in the form of tablet triturates without compression, and, as a precaution, I would suggest that they be tested for solubility from time to time. In no other way can we be certain that the medicament is in a condition to benefit the affected tissues.

"The favorable action of the drug in the treatment of typhoid is entitled to more than a passing observation. Although it does not seem to have any appreciable effect in reducing temperature, yet the favorable progress of the disease and the slight tendency towards the development of complications, together with the marked improvement in the general condition of the entire alimentary tract, are sufficient to stamp naphthol as an important factor in producing this condition. Under the influence of naphthol the dry, parched tongue becomes gradually moist, and the coating disappears; the disgust for food ceases, and the patient seems to eat with a relish the food that is brought him, and would like to have more; and although the fever remains high, sleep appears to be more normal in its character than when our dependence is placed in other drugs which have been recommended."

In addition to its antiseptic action, beta-naphthol is no doubt also a very useful antipyretic. It certainly possesses the power of reducing fever-heat, as has been illustrated in typhoid fever. In chronic catarrh of the bladder beta-naphthol often acts most serviceably. It is eliminated to a slight extent by the urine, which it affects most beneficially, and has in addition an antiseptic action upon the organ itself. The dose of beta-naphthol for internal use varies from ½ grain to 5 grains every three or four hours. Given in too large doses more or less gastric disturbance may follow; it should, therefore, be administered in repeated small quantities, which appear to act more favorably and be better borne by the stomach. On account of its pungent taste and being only slightly soluble in water, it can be more pleasantly and conveniently administered in tablet triturates. Milk, glycerin, and mucilage are also excellent vehicles in which to administer the drug.

The Local Application of Beta-Naphthol.—Beta-naphthol, as has already been shown, is one of the best antiseptic* agents, possessing most powerful action in destroying organisms. It should therefore be preferable for all topical applications when we wish to accomplish the latter purpose. Being non-poisonous and without odor, it can be freely employed. It can be used either in the form of a powder, solution, or ointment. It possesses a stimulating and sedative action when used upon the skin or mucous membrane. The stimulating properties just alluded to will become most marked, especially if the salt is used in a large quantity upon the integument. It should therefore always be employed with caution, particularly upon a sensitive or an inflamed surface. It may thus, by its stimulating action on the skin, have the opposite effect from that intended, and give rise to a more active inflammation. Beta-naphthol is not, therefore, as a rule, applicable in active

* Dr. Eloy "On Naphthol as a Local Antiseptic," *Gazette Hebdomadaire*, April 19, 1889.

integumentary inflammation unless largely diluted and employed only for its antiseptic action. It acts better and more promptly in subacute and chronic inflammations of the skin.

Beta-naphthol soap, five per cent., or eighty-four grains being incorporated in three and one-half ounces of soap, as I have already pointed out, is valuable for toilet purposes, fetid and excessive perspiration, the bites and stings of animals and insects. The beta-naphthol soap, on account of its antiseptic action, is also of service in very many cutaneous diseases and in offensive discharges of the skin. In wounds and injuries beta-naphthol is one of the most important therapeutic remedies that can be resorted to, on account of its antiseptic properties.

Operations performed under beta-naphthol sprays, with instruments, sponges, and dressings containing the same antiseptic, and the wound irrigated with beta-naphthol, will most certainly prevent the ingress of atmospheric germs. It may be used alone, or combined with some other powder and simply dusted over the surface, in order to protect wounds, to remove fetor, and to bring about a change in the character of the discharge from foul ulcers. The combination of beta-naphthol with a mild and soothing powder, as thus advised, is often of much advantage on account of the stimulating effect of the drug when used alone upon a sensitive or irritable surface. Bandages impregnated with beta-naphthol have been tried, with much good result, by Professor J. L. Reverdin. The *Wiener Med. Presse* (November 4, 1888) reports that Reverdin employed the naphthol as a powder, which he dusted upon wounds, and as a ten to fifteen per cent. gauze. The latter was first sterilized at a temperature of 130° C. (266° F.) and then impregnated with an ethereal solution of naphthol. He has employed the naphthol bandages in thirty-eight operations, of which eighteen were cases of tumor-extirpation, four were amputations, one was a laparotomy, three were radical operations for hydrocele, etc. In twenty-three cases primary union was obtained without a trace of suppuration, even at the opening for drainage; in twelve cases there was delayed primary union; and in three cases suppuration occurred as the result of some mistake in the technique of the operation.

Seborrhœa and furuncles are much benefited by the application of a beta-naphthol solution, ointment, or powder. Beta-naphthol has long been known for its destructive action upon all animal parasites of the skin.

It is especially valuable for its power to kill the itch-mite in scabies, lessening at the same time all inflammation superinduced by the parasite and relieving simultaneously by its sedative effect the irritation of the integument. In truth, beta-naphthol has to a large extent taken the place of sulphur and the mercurial preparations, with their noxious odors and irritable impressions upon the skin. Beta-naphthol is not only valuable in scabies, but also for all animal parasites getting on and in the skin. It destroys pediculi on the skin, and relieves the irritation of the integument from the bites of lice dan fleas, bed-bugs, mosquitoes, and other parasites that get upon the skin. In chronic eczema, in the form of an ointment, ten to thirty grains to the ounce of any fatty substance or incorporated with zinc or lead ointment, it acts most decidedly in lessening the infiltration and itching which may be present. In cases of pustular eczema, three to ten grains of beta-naphthol incorporated in the ointment or solution employed acts as an antiseptic and as a deodorant, and produces at the same time a slightly sedative effect upon the surface. Beta-naphthol employed in the form of an ointment, as well as a plaster (ten to twenty per cent. of the salt being used in the latter), is serviceable in the fissured form of eczema on the palms of the hands and soles of the feet. Psoriasis and acne* are likewise benefited with similar applications. In chronic ulcers, especially when the edges are indurated, either an ointment or a plaster of beta-naphthol often proves most curative from its combined stimulating and antiseptic action upon the parts. Beta-naphthol, either alone or even better with some other astringent powder, is most useful and often most curative dusted over the surface of a chancre or chancroids. The following combination has been employed for both the diseases just named with the most happy result:

> Beta-naphthol, 10 grains;
> Subnitrate of bismuth, 1 ounce.
> Mix. Dust over the surface.

This combination, and many others containing beta-naphthol powdered, has a stimulating, astringent, and antiseptic action upon both chancre and chancroids. It is often of

* "The Treatment of Acne," at Dr. Lassar's Clinic, *Journal of Cutaneous and Genito-Urinary Diseases*, May, 1889.

great advantage in the treatment of the various forms of syphilis of the integument to add to the powder, ointment, or solution used a small per cent. of beta-naphthol, especially for its valuable antiseptic effect upon the diseased surface. The fetor so often present in the various forms of cancer, lupus, vulgaris, and other ulcerating affections may be relieved by the addition of a small quantity of beta-naphthol to the dressing employed. Hyperidrosis and bromidrosis, excessive and odorous secretion, occurring on various parts of the body, particularly in the axilla, the inguinal regions, and the palms of the hands and the soles of the feet are usually benefited or entirely removed by a plaster or ointment of beta-naphthol. The use of a powder containing from twenty-five to fifty per cent. of beta-naphthol is sometimes preferable in these diseases, and appears to act more promptly. Chronic otorrhœa may be successfully treated by an application of beta-naphthol in glycerin or water. Purulent ophthalmia is often controlled or cured by an application of a solution of beta-naphthol. M. Valude,* in the *Transactions of the Ophthalmic Society of Paris*, reports much benefit from the employment of beta-naphthol in purulent ophthalmia, in conjunction with cauterization with the nitrate of silver. He resorts to wet compresses of beta-naphthol, the solution being 1 to 2500. He employs the following formula:

℞ Distilled water, 1000 parts;
Beta-naphthol, .25 part;
Alcohol, 25 parts.

This antiseptic solution, Valude reports, reduces the œdema and swelling of the palpebral folds and integument. In purulent ophthalmia MM. Budin and Vignal, of Paris (*British Medical Journal*), have likewise tested beta-naphthol, and have recommended it as being especially efficacious in this affection, the solution used by them being as follows: Distilled water, 1000 grammes; alcohol, 1 gramme; beta-naphthol, .4 gramme. The ophthalmic editor of the *St. Louis Weekly Medical Review*, August, 1888, commenting on the above report, adds, "Eight cases were reported by MM. Budin and Vignal, the first being that of a woman attacked by gonorrhœal ophthalmia with chemosis. The other seven were new-born babes. A slight epidemic of ophthalmia was observed at the Obstetrical Clinic at the beginning of the month of May; it was due to the fact that the precaution of putting a drop of nitrate of silver collyrium in the eyes of new-born babes had been omitted. The most striking feature in the action of beta-naphthol is its rapidity. The children thus treated did not present any swelling of the eyelids, and the purulent secretion was arrested. In the case of the woman above mentioned, there was neither chemosis nor swelling of the eyelids after two days' treatment."

Beta-naphthol, Paul Delagemere† claims, is one of the most valuable remedies in the treatment of granular conjunctivitis. The same author also reports most remarkable results from beta-naphthol in simple conjunctivitis, often succeeding likewise by its application in cases of trachoma. He recommends, however, caution in the employment of beta-naphthol in corneal ulcerations. Beta-naphthol is likewise one of the most suitable and advantageous remedies to use as a dentifrice either alone or in conjunction with bismuth, chalk, or soap. Beta-naphthol solution, especially in glycerin, is of much service as an application to diseases of the mouth and throat In mercurial salivation it forms a most beneficial application, used as follows:

Beta-naphthol, ½ drachm;
Glycerin, 4 ounces;
Distilled witch-hazel, 2 ounces.
Mix. Use as a gargle.

This same prescription is also valuable for many other throat affections, especially those of a chronic nature. Follicular pharyngitis, elongated uvula, relaxed palate, and chronic catarrh of the fauces may be much benefited by inhalations or the employment of gargles containing beta-naphthol. Beta-naphthol used in the form of a solution is of much value in abscesses and in vulvitis in children. Indurated glands‡ are much benefited and often removed by injections into them of a beta-naphthol solution. Vaginitis, and purulent and offensive discharges from the vagina may be controlled or completely removed by the employment of injections containing beta-naphthol. The same remedy is most useful in gonorrhœa and in gleet owing to its antiseptic action. The following combination is a serviceable injection in the latter diseases:

Beta-naphthol, 2 to 10 grains;
Glycerin, 1 ounce;
Water, 1 to 3 ounces. Mix.

* *Indiana Medical Journal*, February, 1889.

† *Medical Standard*, Chicago.

‡ *Le Praticien*, April 8, 1889.

Among the numerous remedies with which beta-naphthol has been efficaciously combined by me for some years may be mentioned camphor. M. Desesquelle (*Archives de Pharm.*, September, 1888) has also offered the same suggestion. The beta-naphthol-camphor or camphorated naphthol is formed of a mixture of one part of naphthol with two parts of camphor, developing a colorless syrupy liquid, which possesses both local stimulating and somewhat sedative action upon the integument to which it is applied. This mixture is recommended * as less poisonous than carbolic acid. Incorporated with either lard, simple or zinc ointment, in the proportion of five to twenty grains of the beta-naphthol-camphor to an ounce of the fatty vehicle, forms a most valuable antiseptic and combination for very many cutaneous diseases. Desesquelle † recommends beta-naphthol-camphor as a topical antiseptic in excoriations, wounds, and ulcerations, as well as an application to the throat in diphtheria. Dr. Perier ‡ has also used beta-naphthol-camphor with success in ulcers, tubercular laryngitis, and upon the membrane of diphtheria. He reports prompt healing of ulcers upon its application. Beta-naphthol-camphor has proved of great service to Dr. Fernet,§ who reported excellent results from its employment in tubercular ulcerations at the Société de Thérapeutique, February 27, 1889.

Buccal tuberculosis, he stated, although not cured, was greatly ameliorated by beta-naphthol-camphor. Fernet also recommended beta-naphthol-camphor in the treatment of boils, ulcerations of the skin of the mouth, and diphtheria.

1519 WALNUT ST., PHILADELPHIA.

ON THE ALLEGED TOLERANCE OF THE IODIDES IN LATE SYPHILIS. ‖

BY HENRY W. STELWAGON, M.D.

THE statement made by Dr. H. C. Wood that a tolerance to full doses of the iodides in central nervous disease is indicative of a syphilitic origin has naturally provoked a warm discussion, in which this distinguished writer stands practically isolated. It has, indeed, been a current saying for years that syphilitic patients failed to show symptoms of iodism, and yet it is difficult to find authoritative statements that could have led to so common a belief. Even at the present day, as all medical teachers, and especially those engaged in dermatological and syphilological practice, must know, the question of this tolerance is often raised by students and practitioners. In the face of my experience with this drug in syphilitic eruptions, both early and late, I can scarcely comprehend on what ground such a belief had been based. For, so far as my dermatological experience goes, which necessarily includes numerous cases of syphilis in all stages, I must say, without the slightest hesitation or equivocation, that there is absolutely no foundation for a belief in this tolerance in syphilitic patients. To give any importance, in such cases, in a diagnostic sense, to the patient's ability to take full doses without the usual physiological or toxic effect, would, therefore, from a dermatological stand-point, be not only without value, but injudicious and unfair to the patient. In this respect my experience is the same as that of those who, with Dr. White, made response to Dr. Wood's paper. The following several cases, briefly noted, are so many reasons for the opinion herein expressed:

CASE I.—J. H., aged 30, came under treatment in February, 1888, suffering with an ulcerating tubercular syphilide, involving the end of the nose and the upper lip immediately underlying. It had made its appearance nine months previously; syphilis was contracted six years before. The mixed treatment was prescribed, but it was soon found that not more than two or three grains of potassium iodide or sodium iodide t. d. could be taken without distressing symptoms of iodism. The symptoms referred to were a marked coryza, with frontal pain, gastric disturbances, and iodide acne.

CASE II.—In the nature, character, and locality of the eruption this case was strikingly similar to Case I. The patient, a female, aged 43, was first seen in March, 1887. The present eruption had lasted seven months. Date of contraction of syphilis unknown, but the history indicated some years previously. In this patient the iodide, even in small doses, was not well borne, and seemed also to be

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* *London Pharmaceutical Journal and Transactions*, September 20, 1888.

† *Journal de Médecine de Paris*, No. 7, 1889.

‡ *Semaine Médicale.*

§ *Le Progrès Médicale*, March 9, 1889.

‖ Read at the Thirteenth Annual Meeting of the American Dermatological Association, September 18, 1889.

without influence on the eruption. Acne, coryza, and cephalalgia soon followed its administration, and it was necessary to discontinue. Under mercury the patient made a rapid recovery.

CASE III.—This case, a male, aged about 25, came under my notice in the winter of 1888, in the Skin Ward of the Philadelphia Hospital. He was suffering with a traumatic ulcer of the leg, for which, under the impression that it was of a syphilitic origin, the resident physician prescribed 10-grain doses of potassium iodide t. d. The history of the case disclosed the contraction of syphilis six or seven years previously. No improvement taking place in the ulcer, the dose was increased to 20 grains. A few days later a pustulo-bullous eruption developed on the face and hands. The lesions apparently involved the deeper skin tissue, and were elevated from an eighth to half an inch above the surface. Some were the size of a bean, others almost the size of a hen's egg. It was at this time that the patient came under my care, having been transferred from the Surgical to the Skin Ward. The eruption was recognized as probably due to the iodide, and its further administration was discontinued. In the course of a week the lesions had almost disappeared. He was again given the iodide to determine beyond doubt its causative relationship to the pustulo-bullous eruption. As soon as 20-grain doses were reached the lesions rapidly made their appearance. On discontinuance of the drug the eruption as rapidly retrogressed.

These several cases are here presented as striking examples of late syphilis, in which the intolerance to the iodides was unmistakable. Nor are they exceptional cases, as the notes of many more such examples could be given if the subject demanded it. These, however, are sufficient to indicate the basis upon which my opinion on the question of the tolerance of iodides in syphilis rests. Exceptional instances also occur in which the disease, although undoubted syphilis, fails to respond to extreme doses of the potassium or sodium iodide. Take, for example, the following case, and if the tolerance of full doses was to be looked upon as diagnostic, the result upon pushing the drug should have been confirmatory. On the contrary, although it was a clear case of syphilis, the drug was absolutely powerless.

CASE IV.—The patient, a well-built, robust man of 36 years, came under treatment in 1886. He had contracted syphilis several years previously, and had made an apparent recovery. Some months ago, however, a tubercular and gummatous syphilide appeared on the scalp and one hand, and was rapidly progressive and destructive. The ordinary plan of treatment was adopted, but with no result. Finally, the iodide of potassium was prescribed, without the mercury, as in the preceding treatment, and the dose rapidly increased. Beginning with 20-grain doses t. d., the quantity was increased daily until the patient was taking six drachms a day, without a symptom of iodism, and although this dosage was continued for one or two weeks, there was not the slightest influence upon the course of the syphilide. This patient was finally cured by mercurial remedies alone.

Another case, presenting a slightly different phase, may be added.

CASE V.—This patient, a male, of about 40 years, presented himself several years ago at the Skin Service of the Northern Dispensary. He sought treatment regarding an acne-like eruption on the nose and on the parts immediately about the alæ.* In this patient, 30-, and even 40-grain doses t. d. were without effect, and a possibility of an error in diagnosis was considered, and the case then tentatively treated as simple acne. No benefit resulting, and the diagnosis of syphilis having been previously made after the eruption had been carefully studied, the iodide was again administered, and the dose increased to 60 grains t. d. This amount of the drug brought about rapid improvement, and in a short time a complete cure. There were, however, during the administration of the drug, evidences of mild iodism.

It cannot, of course, be denied that some patients with syphilis bear the drug well, but this holds equally true with non-syphilitic patients. This latter is shown in the report made by Haslund† on the treatment of psoriasis with large doses of iodide of potassium, and it will be found that in these cases, presumably free from syphilis, that iodism was no more common than it is observed to be in syphilitic patients. In this report brief tabulated notes of fifty cases are given. The dose per day varied in the different patients from one hundred and fifty to seven hundred

* "A Case of Late Cutaneous Syphilis (Acne-like Syphiloderm of the Nose), illustrating the Occasional Necessity of Large Doses of Potassium Iodide" (*Philadelphia Medical News*, June 27, 1885).

† *Vierteljahreschrift für Dermatologie und Syphilis*, 1887, H. 3.

and fifty grains, and yet with these enormous doses it was recorded that in a fair proportion iodism was not observed. My own observations in regard to iodism in late cutaneous syphilis would show its occurrence in about the same proportion as in these cases of psoriasis tabulated by Haslund. In experiments lately made by Dr. Hartzell and myself in the Skin Dispensary of the University Hospital, and also in the Skin Ward of Blockley Hospital, as to the curative effect of full doses of iodide in psoriasis, suggested by this paper by Haslund, symptoms of iodism were not observed to occur with any greater frequency than would probably have been noted had the cases been syphilitic. The fact also cannot be forgotten that in many of the cases of serious cutaneous disturbance from the ingestion of potassium iodide, which have been reported in the journals the past several years, the drug had been administered for late syphilitic manifestations.

Indeed, with the light that has been thrown upon this subject the past year, it can no longer be doubted that as regards cutaneous syphilis, early or late, there is just as much probability of iodic symptoms from the administration of the iodides as were the patients non-syphilitic. As to the contention that in central nervous syphilis iodism is an extremely rare occurrence, Dr. Wood, it must be confessed, has those who hold opposite views at great disadvantage, for, with possibly one exception, those replying to his paper are dermatologists and syphilographers, and not neurologists. But it is irrational to suppose that if patients with other manifestations of syphilis show no freedom from iodic symptoms, those with nervous syphilis should prove an exception. It could be readily admitted, I think, if we are to accept the latest view as to the production of symptoms of iodism through the agency of the central nervous system, that in serious disease of these parts the appearance of such symptoms might be hindered or modified. But an explanation of this kind would hold equally true in regard to non-syphilitic nervous disease; whereas Dr. Wood contends, it will be remembered, that the absence of iodism where full doses are given to cases of grave nervous disease is reason for believing that the disease is in all probability of syphilitic origin or nature.

In conclusion, it may be said, however, that at present the general evidence is overwhelmingly against the correctness of such statement.

CLINICAL OBSERVATIONS ON RHUS TOXICODENDRON.

By John Aulde, M.D.*

SOME years ago, while looking up a desirable remedy for the relief of an obstinate case of sciatic rheumatism, my attention was attracted by some remarks dropped by one of my patients, who claimed that he had long suffered from what is termed varicose veins and from chronic rheumatism, which the doctors had pronounced incurable. He was advised to obtain a preparation made from the poison sumach, which is referred to generally as rhus toxicodendron. He told me that the parties giving him the remedy advised him to take only so many drops,—5 drops, I think; but he said he took as high as 9, and felt no bad effects from it. He said he believed it would be safe to take as many as 15 drops. I thereupon began an investigation as regards the history of this drug, and found that it had been used only to a limited extent, and was not generally believed to possess any value, although it was regarded as an acrid and dangerous poison. With a view to obviate any dangerous symptoms which might arise from its use I began with very small doses, and was agreeably surprised at the result which followed its exhibition in suitable cases.

In the latter part of April I published a short communication in one of the medical journals,† which attracted wide attention on account of the character of cases related, most of them being of a character which indicated that the trouble was rheumatic, and it included sciatic rheumatism, muscular rheumatism so called, and varicose veins; but, in giving an account of these cases, I inadvertently omitted giving full particulars in regard to the dose of the drug. The result was that I received a considerable number of communications from members of the medical profession throughout the country in regard to the dose, asking me for more information, and for instructions in regard to the preparation which I had used, and the effect which might be expected from the ingestion of large doses. In order to comply with these requests, and to further the interests of the profession, I made arrangements for procuring a supply of the drug, and to each applicant I forwarded

* Demonstrator of Clinical Medicine and of Physical Diagnosis in the Medico-Chirurgical College of Philadelphia.

† *Medical News*, Philadelphia, April 20, 1889.

a sample, with instructions for use, and at the same time requested that within a reasonable period they should advise me of the result of treatment which might come under their observation. I have now received quite a number of reports from physicians in different sections, although there are others who have not yet reported the results of treatment; some have not had an opportunity of using the drug, while others have not had sufficient experience to warrant them in making a statement. There seems to be considerable diffidence in giving an opinion concerning a remedy which is altogether new and is given in such small doses as rhus toxicodendron. The object of the present paper is to give a summary of the experience of those gentlemen who have been kind enough to send me their reports, and at the same time I wish also to give full instructions in regard to the preparation and the dosage and other matters, which will enable those who use the drug to determine the indications for its use.

The preparation which I have used is the tincture, prepared according to the directions of the Pharmacopœia for the making of tinctures from fresh herbs,—50 parts of the fresh leaves to 100 parts of alcohol. This makes the strength of the tincture 1 to 6, although certain manufacturers claim to be warranted in estimating the strength at a lower proportion,—namely, 1 to 8. The dose of this tincture, in my experience, does not exceed ½ drop. It should be prepared with diluted alcohol, and used in the strength of 1 part to 10,—that is, 1 part of the tincture to 9 parts of diluted alcohol. The dose of the solution will, therefore, be 5 drops, each dose containing one-half drop of the ordinary tincture of the Pharmacopœia.

It will be convenient here to refer to other preparations of this drug, but more especially to preparations of the fluid extract. Some of my correspondents, after reading my article, procured some samples of the drug, but were unfortunate in not obtaining the expected results from its use, and accordingly they wrote to me. One complained that the dose of the preparation was too small, while another said the dose of the fluid extract, as given upon the labels of the bottles containing it, was too large, and, further, that the fluid extract did not correspond with the tincture which I had sent them in color and in the odor, as learned from applying the bottle to the nostril. My own investigations with the fluid extract on the market have not been completed, but at this time I am not disposed to take kindly to its use, for the reason that it is lacking in some of the more important properties which may be noticed in connection with the tincture; and I am inclined to believe that whatever virtue lies in the toxicodendric acid contained in the plant may be lost in the process of drying. When we bear in mind the active poisonous properties of this plant, and remember that during the early spring many persons cannot safely expose themselves to the most gentle zephyr which comes from the direction of the poison sumach, this assumption does not seem unwarranted. In preparing the solutions for use in the office, I have often felt an unusual and not a very comfortable sensation in the pharynx, although I do not think I am especially susceptible to the action of the poison, never having had any symptoms after exposure. Again, my suspicions were aroused owing to the maximum dose of the fluid extract which was permitted. According to my calculation, it is at least six hundred times the maximum dose that I have been in the habit of using; and, I may add, that frequently I have met with most happy effect from the administration of doses the size of which, as compared with that now recommended, would make the latter appear immense. Some of these results have been observed in the most stubborn cases which have come under observation, when other drugs and methods of treatment had utterly failed, and I am, therefore, disposed to conclude that the active principle lies in the toxicodendron acid, and that this active principle is lost in part, or wholly destroyed in drying. The foregoing statement seems to be demanded for the reason that many physicians reading this article will conclude that any preparation will answer, and when they fail to observe the effects claimed for it, the drug will be roundly condemned.

As an offset, however, to any *dénouement* of this character, I have been so fortunate as to get very flattering reports from various sources, in which competent and disinterested observers relate fully the experiences which have followed its administration in different classes of cases, and my thanks, as well as the thanks of the entire medical profession, are due to these gentlemen whose names are mentioned below as having used this new remedy for the relief of diseased conditions.

Since the publication of the paper referred to, my own experience has been substantially the same as it had been previous to that time, but it may be well, however, to caution the

reader that rhus toxicodendron is not an infallible remedy for all rheumatic affections. I do not think it would be of great benefit in acute attacks, and my experience does not justify the statement that it can be depended upon invariably for relief in all chronic cases. I may mention as an illustration of this two cases coming under observation recently, that of a gentleman and his wife, who are now approaching 70 years of age. The husband, forty years ago, suffered from inflammatory rheumatism; it became chronic, and he was long unable to walk without a cane, and in coming down-stairs in the morning he was so stiff that he was compelled to crawl down backward. The wife has lately suffered from rheumatic attacks, stiffness, pains in the knees, fugitive pain in the ankles, in the feet, and in the shoulders. At first the medicine affected her promptly; in less than two days she was able to walk without the least difficulty, and apparently had fully recovered; but, unfortunately, she was suffering from a general debilitated condition of the system, which was further complicated by heart-trouble.

An attempt was made in this case to increase the nutrition by tonic treatment, by advising rest and nutritious diet; but, unfortunately, the advice was not taken, and the patient insisted upon being around and at work, and, I believe, was unwilling to take the necessary rest which nature demanded. The result was that she became worse after a time, and, as the pain returned, she requested that something should be furnished which would afford relief, and, fortunately, I found in antipyrin a remedy of sovereign value. The husband, on the other hand, enjoys much better health, and, notwithstanding the rheumatic element, is able to conduct his business, which is that of a florist, evidently much improved. He had not taken the medicine a week until he realized that he had feet, something which he had not felt for the preceding five years.

In reply to my inquiries as to the experience which has been observed after the administration of rhus toxicodendron, the following-named gentlemen have communicated to me the result of treatment. Some of the communications have been abridged, but no matter of material significance has been omitted. Items of a personal character have been eliminated, and some of the details connected with the cases have been left out, simply for the purpose of economizing space.

Dr. B. W. Allen, of Jernigan, Ala., writes as follows: "I have used the rhus in two cases. One was that of a lady, 68 years of age, who had suffered from sciatica in the right leg for some time. When first taken was unable to walk at all for several weeks, but, by the aid of a stick and chair, she was able to walk around the room when I began giving the rhus. I saw her one week after she began taking it, and she was then walking without the assistance of any one, and has since then walked to a neighbor's house and back, which is half a mile. She still complains occasionally of pain in the hip, but by recurring to the rhus is promptly relieved. The second case was that of a lady, 28 years of age, who had been suffering from a chill, with neuralgia in both arms. About six months ago the pain became almost constant, and I exhausted the materia medica in trying to relieve her, but failed until I put her on rhus. She took two drachms of the solution, and I have heard no further complaint from her. Was told a few days ago that she had not suffered any since taking the medicine. Will say in conclusion that I consider rhus toxicodendron a valuable remedy in the treatment of neuralgic affections such as you suggest."

The dose of the solution, prepared according to the formula given by me, was 5 drops in water three times daily.

Dr. T. C. Fenton, of Streator, Ill., makes a report covering the use of the drug in several cases, of which the following is a summary:

"CASE I. was that of a widow, æt. 55, who, about ten years ago, had a severe attack of acute rheumatism, and since then has had slight muscular pains. About May 1 the rheumatism affected the left knee, and was very painful, extending upward to the groin; she was able to sleep but little. Took the sulphate of quinine, salicylic acid, and salicylate of sodium, with no effect. On May 10 I gave her some of the rhus tincture diluted, with directions to take 5 drops in water three times daily. After she had taken four doses I saw her again, when the pain had nearly all left, but she complained of a sort of numb feeling. She said when she awoke that morning all rheumatic pains had gone; but, in her words, 'a numb, dead feeling' was present, and she could not bear her weight on that limb. I urged her to try to stand on that foot, but after a prolonged effort, during which time I used massage, all attempts failed. She had taken about sixteen doses,

but the first four doses took all the pain away, which, during the first ten days of May, was very severe. The strength returned to the limb, but the stiffness remained. Now she is stiff in both legs and a little in the arms.

"CASE II.—Rheumatism of the thigh, extending to the knee. Took tincture of rhus diluted, 5 drops for a dose, three times daily, for six days, with no relief.

"CASE III.—F., aged 25; pregnant seven months; neuralgia of face; of a nervous temperament; in great suffering. Gave the same dose of the rhus as in Case II., with no effect.

"CASE IV.—Male, aged 38; was attacked with a severe pain, most certainly in the great sciatic nerve; had pain constantly for four weeks. Was treated by three other physicians in this place. Came to me, and was treated with everything in the way of medicine that I knew of, all to no purpose. Was becoming weak and nervous for want of rest and food. I advised him to go to Chicago. He did so, remaining in one of the hospitals attended by one of Chicago's best physicians for ten days, when he came home about as he went. He intended to return to Chicago in a few days. I saw him, and asked him to try another remedy. Gave the tincture of rhus toxicodendron diluted, with directions to take 5 drops in water three times daily. After taking five doses, he awoke in the morning scarcely able to find his sciatic pain. Felt only a few twitches of it that day, and has never felt it since; feels well and strong."

Dr. Fenton now asks, What was the difficulty with the first case? He thinks probably he may have used too large a dose of the medicine. There is still stiffness and some slight paralysis remaining. In the second case, I should say probably the drug was not adapted to the disease, or was not continued long enough. In the third case, all general practitioners well understand that those peculiar neuralgic and facial troubles are likely to appear in cases of that character, and often fail to yield to any treatment.

Dr. J. B. Laidley, of Carmichaels, Pa., reports the following interesting case:

"The patient, a minister, about 80 years of age, is now subject to, and has for several years suffered from, chronic cystitis. After serving his people as usual on Sunday, the 13th of June, was suddenly taken with severe pain along the course of the sciatic nerve. I saw him on Monday, and, after administering a hypodermic injection of morphine, ¼ grain, placed him upon the tincture of rhus toxicodendron, 4 drops of the tincture, prepared as you directed, every four hours. With the exception of the hypodermic of morphine once each day, I gave him no other medicine. There was no change observed until Saturday, the 22d, when he was decidedly better. On Sunday, the 23d, however, he was worse, partly from an increase of the cystic trouble. The hypodermic injection of morphine was continued until the 26th, on which day it was omitted because of freedom from pain, since which time he has steadily improved, and for two days has had no pain. On Monday, the 24th, I gave him three doses of 4 grains each of the sulphate of quinine; with that exception he has had no other treatment than as above described. He had two previous attacks of sciatica, the first very obstinate, disabling him for about three months, both attacks being finally arrested by the use of the actual cautery, so that I have good reason to believe that the new remedy has had a decided effect in relieving him of this attack. With the exception of two days—the 23d and 24th—he informed me that his cystic trouble has been greatly relieved since his confinement to bed with the other trouble. I will advise you as to whether the relief he now enjoys proves permanent. I continue the remedy."

Dr. H. A. Mobley, of Byromville, Dooly Co., Ga., reports two cases, as follows:

"The first, a case of sciatica of six months' standing, in which rhus was given for about two weeks. Prior to this he had poor results from the use of colchicum and the salicylates, from which but little benefit was derived. After taking the rhus," he says, "the patient has been in better spirits, walks with much more ease, and is in better condition generally. He (the patient) says it has not benefited him at all, though I am inclined to the contrary opinion. However, I do not consider the case a fair one for trial. The other is one of articular rheumatism in a 12-year-old boy, very weak, pale, and anæmic. He came under treatment before I received the sample, though he is now on tonic treatment, with the rhus as a specific. He has gained in weight, looks one hundred per cent. better, and the pains are about gone. He is well pleased with the progress, and thinks he will soon be well. You are aware," he says, "that in the country like this we cannot experiment with the same ease as the city brethren, nor can we keep as perfect a record. I try hereby to show my appreciation of your kindness, and while the above is in no form of a report,

if you can obtain any encouragement from the results of a treatment, which you seem to have originated for this most formidable type of disease, I will feel amply repaid for this note."

Dr. B. Powell, of Houston, Texas, writes as follows:

"*June* 20.—I have suffered for years with rheumatism, and when I saw your article in the *Medical News* had almost despaired of ever obtaining relief, and when the medicine and directions arrived I was so sceptical that for some days I delayed using it. The dose seemed so infinitesimal. I was suffering so much with stiffness and pain around the knee and ankle-joints that I commenced with 5-drop doses, and in three days I began to feel better than I had done for months. I have continued until date, and now scarcely recognize the existence of pain. True, the stiffness has not all disappeared; nevertheless, I feel confident that the continued use of the rhus will entirely restore the suppleness of the articulations. I shall continue the use of the drug, and shall use it in my practice."

On the 28th of the month, Dr. Powell writes me to say that the action of the medicine has been beneficial in another direction. He says,—

"I did not when I wrote you state the effect of the medicine upon hemorrhoids. I have suffered from that intractable trouble for years, but while taking the rhus I was entirely free from all rectal annoyances. Immediately, however, upon stopping the medicine the piles returned. I don't pretend to say that the freedom from piles experienced while taking the medicine was the result of the drug, or simply a coincidence. Still, I am inclined to believe that there was a direct effect produced upon the varicose blood-vessels of the lower rectum. At all events, upon taking the rhus again, the rectal trouble is much less, and, by continuing its use, I hope to finally be rid of both rheumatism and hemorrhoids. If this is a *post hoc* instead of a *propter hoc*, I shall soon discover."

Dr. J. Richard Taylor, recently elected to the Chair of Practice in the Medical College of the State of South Carolina, at Charleston, writes me as follows:

"I have not had many opportunities for testing the rhus. In cases of subacute and chronic rheumatism affecting the muscles I have found it very efficient; though less prompt than sodii salicylas, but with the advantage of being always tolerated by the stomach of delicate patients. In the soreness of muscles so common after hysterical convulsions I have found it *very* prompt, relieving the pain and stiffness within a few hours."

Dr. J. W. Welch, of New Hope, Mo., writes as follows, under date of June 17:

"I have been able to test the rhus in only two cases. My wife had suffered from severe rheumatic pain under the left scapula for several weeks. Before I employed the rhus she had taken the usual remedies, and used counter-irritation without benefit; but just about the time I received your sample of rhus she applied a belladonna plaster over the scapula. The tincture was diluted with alcohol, as directed by you, and given in doses of 3 drops thrice daily. In the course of two weeks she was entirely well. I also gave it to an old lady suffering from sciatica, whose condition had not been benefited by several months of treatment with salicylate of sodium, and many other remedies usually employed in such cases. She is better, and thinks the medicine benefited her. I am unable to express a decided opinion in regard to the merits of rhus in chronic rheumatism from the limited opportunity I have had of observing its effects, and think it might be given safely in larger doses and with better effect."

Dr. J. B. Whitehead, of Lovingston, Va., reports two cases under date of June 15. He says,—

"I have used the rhus in only two cases. One is that of a man, 45 years of age. He had sciatica in both nerves for several weeks before using the rhus. I gave him 1 drop of the solution (made as you directed), which was increased in a day or two to 2 drops three times a day. In about a week he was well. He says that it not only relieved the pain but gave him a good appetite. The other case is that of a woman about 65 years of age. She has had heart-trouble for over twenty years, and suffers almost constantly from rheumatism and neuralgia. She was not improved, but I am inclined to think it may be due to her not giving it a fair trial. The dose being 1 drop, she concluded it was *very* dangerous, and consequently did not take it as she should have done."

Dr. Whitehead says also that he would like to know what would be the effect of too large a dose, and what would be the effect of the drug if too long continued, questions which I shall briefly consider in connection with the comments which seem to be demanded from the history of the foregoing cases.

Remarks.—To say that the foregoing records present a remarkable showing is but to

express the matter in mild form, and had they come from a single observer, these cases would have been regarded suspiciously, if not set down as gross exaggerations. Seven cases were reported in April, representing as many different diseased conditions, but they by no means cover the extended uses to which I have applied rhus toxicodendron, from the fact that it is a drug almost daily in demand, and this has been the case for the past two years, so that the unusually wet season we have experienced in this section does not altogether account for the prevalence of the class of cases in which it may be used with a reasonable hope of success.

The cases reported by Dr. Fenton are somewhat peculiar, but I think these peculiarities can be accounted for without any discredit to the drug. The trouble with the first cases was in all probability due to venous stasis rather than to an overdose of the drug, but it shows the great power of the remedy over that class of affections, and, in reply to his inquiry, I advised him to place the patient under the influence of small doses of strychnine to improve the strength of the limb, and for the stiffness I should recommend antipyrin in doses of not more than 5 grains every two hours, until there was an abatement of the symptoms. Faradism to the muscles would also be valuable, and might be used as an adjuvant to other treatment. In his second case, the drug may not have been long enough continued, or there may have been complications, of which I shall speak later, which should have received attention in connection with the exhibition of the rhus. The third case, that of the pregnant woman, is one of those very intractable cases met with occasionally by the general practitioner during the later months of pregnancy, and is frequently attended with softening and breaking down of the teeth, showing that there is such a demand on the part of the fœtus for bone-making material that the nervous system of the mother becomes exhausted. Such cases should have attention to the functions of the liver first, and the bowels should be kept in a healthy condition by simple measures, when it will be found advisable to take into consideration the value to be gained from the exhibition of the phosphates, and possibly the judicious administration of arsenic in some of its forms.

Dr. Powell speaks very highly of the value of rhus in connection with the pain and annoyance attending the presence of hemorrhoids, all of which I can fully endorse. It is truly wonderful how quickly local irritations of this character and varicose veins are subdued, and my observations incline me to consider favorably the use of some drug in connection with the rhus which will favor a more active discharge of the functions of the lower bowel, from the fact that hemorrhoids and constipation often go together. Few physicians would be willing, however, to say that there was any relation existing between rheumatism and hemorrhoids, or between rheumatism and varicose veins; but it seems to me that a relationship can be inferred, if not demonstrated, from the results which attend the exhibition of certain remedies. Knowing that cascara sagrada has been highly extolled for the relief of rheumatism, and knowing, further, that it acts mildly as a laxative, and is thus calculated to reduce the congestion of the pelvic organs, including the rectum, I have made a combination of the rhus with cascara cordial with the happiest effects.

The *complications* which are to be met in connection with the exhibition of rhus for chronic rheumatic and allied affections may be estimated when we consider that the source and real character of the disease are still shrouded in mystery. The farmer, when about to prepare for sugar-making in the spring, knows very well, from the appearance of the bark of the trees, which are the hard and which are the soft maples, and makes his selection accordingly; but the physician, when he is confronted with a case presenting peculiar symptoms, while he may be satisfied that there is a real cause, he is unable positively to determine the root of the difficulty, and must await developments, just as an inexperienced farmer would have to await the appearance of the foliage on the trees before being able to determine the real character of the tree. It would then be too late to tap, because the sap has gone to the branches. We are frequently at a loss to say positively if a case will ultimately develop into rheumatism, gout, or diabetes, and, when a nondescript affection appears, we endeavor to cover our ignorance by calling it something which shall not decide which it is, as in the case of so-called rheumatic gout.

But this question opens up a field of such vast extent that its consideration will have to be omitted at this time, although it would be interesting to study the influence of this drug upon the poisons found in the system, such as result from decomposition, from the products of microbic and bacterial changes, as well as its influence upon suboxidation. The prompt

results following its use in many cases coming under the observation of the writer, coupled with the confirmatory evidence related above, all combine to lead us to the supposition that the drug accomplishes something more than simply the relief of pain, and indicates that it may even in very small doses have some very decided effect upon metabolism. This, however, is a duty which devolves upon the physiologist rather than upon the clinician, and I trust in the near future that so promising a remedy will not fail to attract their attention.

Dr. Laidley's case of cystitis shows unmistakably that it does modify the urinary secretion, and my own experience proves beyond question that this action in cystitis is curative. After the exhibition of the drug for a few days, the urinary flow is decidedly increased, and the acid character is modified to that extent that no disagreeable symptoms attend upon micturition; the appetite improves, while he who has suffered torments in trying to secure much-needed rest is lulled into a repose which is not unlike that of early childhood.

There are many other things which might be noted in connection with its therapeutical indications, but sufficient has been said to prove conclusively that rhus toxicodendron is a drug which is fully entitled to our consideration and study, and, as has been suggested by Professor Taylor, it may often be used with advantage when patients cannot take other medicine which has a tendency to derange the stomach. I have no doubt but that other indications will be pointed out for its employment by those who become familiar with it from practical experience, after they have become convinced, as others have been convinced, of its efficiency even in small doses.

Replying to Dr. Welch's suggestion that larger doses might be used with better effect, I am unprepared to say, as thus far I have been able to get all the effects from the administration of the doses mentioned that could be expected of the drug under any circumstances, and while the small doses only are used, the dangers from toxic symptoms are not likely to arise. Dr. Whitehead's case, in which 1, then 2 drops of the solution were given with marked benefit, apparently furnishes a complete answer to this question. One drop, it will be remembered, represents but one-tenth of a drop of the tincture, the dose which Dr. Whitehead's patient took at first, although I would suggest that as the drug appears to be promptly eliminated through the kidneys, when smaller doses are taken they could safely be repeated at more frequent intervals, and under such conditions I have no doubt more prompt effects would follow its exhibition.

4719 Frankford Avenue.

A PLAN FOR RELIEF OF WHOOPING-COUGH SPASM.

Dr. Naegeli publishes in the *Correspondenzblätter für Schweizer Aerzte*, a paper on whooping-cough, in which he pays particular attention to the convulsive attack of choking, describing the latter as follows: Spasm of the glottis makes every inspiration impossible, tonic convulsions of all laryngeal muscles follow, all muscles of the throat, and at last those of the face, also share in the attack. Trismus almost always is present during the acme of the convulsion, although the tongue generally protrudes. As soon as it is possible to open the rima glottidis again so far as to admit of sufficient air for respiration, all sensation of choking and congestion of the blood with their sequelæ disappear as by a miracle. Heiberg was the first to observe that the raising of the upper jaw is the best method of making the larynx admit air, and he recommended a plan for that purpose, which Kappeler had mentioned before him, and which Naegeli has modified and described as follows: Standing in front of the child, the nurse lays firm hold with the index and middle finger of the ascending ramus of the lower jaw in front of the ear, places both thumbs against the chin, and by strong but gentle traction and pressure moves the lower jaw forward and downward. If the mouth is a little open the jaw may be fixed by placing the thumb or index finger along behind the anterior lower incisors and grasping the chin with the rest of the hand, performing traction as above. In all these cases the left hand rests on the forehead of the patient and performs counter-traction. If the nurse is behind the patient, she may place both thumbs close above the angle of the jaw, the index on the zygomatic arch, and the rest of the fingers on the chin, pushing forward and downward. Immediately the upper jaw is raised the child must be told to draw a deep breath. The plan may be adopted even if the fit comes on during sleep, and Naegeli says that if so the child does not wake.—*Lancet*, August 17, 1889.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

THE PHYSIOLOGICAL ACTION OF THE ALKALOIDS OF COLCHICUM.

IN the *University Medical Magazine* for July and August, 1889, Dr. Adolfo Ferrer y Leon publishes a paper with the above title. He finds that under the influence of colchicine there is a progressive failure of reflex activity, which probably depends upon the depressant action of the sensory nerves, while he claims that it produces marked fall of bodily temperature, fall of arterial pressure, and slowing of the pulse.

The author makes the questionable statement that the "slowing of the pulse is not due to stimulation, but to depression of the heart," claiming that the truth of this statement is proved by the fact that section of the pneumogastric produces as rapid a rate after the administration of colchicine as occurs normally when the nerve is cut. Although the author's experiments in this connection are very imperfect, as far as they go they seem to show that the slowing of the pulse, produced by the injection of the colchicine, is due to the stimulation of the cardiac inhibitory centre in the medulla. Of course, to settle the question, the drug should be injected after previous division of the pneumogastrics. This, unfortunately, the author has neglected to do.

On the other hand, the single experiment which is published appears to show that the drug produces considerable increase of blood-pressure, rather than fall of arterial pressure, as claimed in his conclusions, the pressure rising from 117, the mean pressure at the time of injection, to 168, the mean pressure six minutes later, at the time of section of the pneumogastrics. No light is thrown on the causation of the rise, or as to why the author drew a conclusion opposed to the published facts.

As regards colchiceine, which results from the action of dilute mineral acids on aqueous solutions of colchicine, it is claimed by the author that it produces depression in excitability of the motor nerve-trunks without action on the sensory nerves, and that it possesses but little action on bodily heat.

As regards its action on the circulation, the author states that there is produced a slowing of the pulse, which is but slightly altered by section of the vagus nerve.

"That this slowing of the pulse was not due to cardiac depression, as occurs with colchicine, is apparent from the fact that there was no fall of arterial pressure, and that the heart-beats remained at their normal size. It was found, however, that section of the vagi did not cause the usual increased pulse-rate. That the drug stimulates the peripheral ends of the inhibitory apparatus was, however, determined by the previous administration of a large dose of atropine sufficient to paralyze these filaments, when it was found that the colchiceine was incapable of increasing the cardiac rate."

The author, therefore, concludes that while colchicine has scarcely any effect on the circulation, colchiceine stimulates the peripheral vagi, but does not depress the heart-muscle. In this connection also it is to be regretted that the author has not published a larger number of experiments. Experiment 14, in which the pulse was increased from 186 to 258 within five minutes after the injection of colchiceine and after previous administration of atropine, scarcely warrants the statement that under these circumstances "colchiceine was incapable of increasing the cardiac rate." It is to be regretted that the author has not published a larger number of experiments in detail, for he seems to have been especially

unfortunate in his selection of examples, since, taken individually, they appear to prove the direct opposite of his conclusions.

THE THERAPEUTIC ACTION OF THE BROMIDE OF RUBIDIUM AND AMMONIUM.

STARTING with the idea that the activity of the bromides in alkaline combination is in proportion to the atomic weight of the base, Professor Laufenauer, in *Wiener Medisinische Wochenschrift*, July 13, 1889, was led to experiment with the combinations of bromine with rubidium and cæsium, of which, as yet, only the first has been employed in his studies. On account of the greater readiness in its manufacture, and thus its consequent greater cheapness, the author did not employ the pure bromide of rubidium, but its mixture with bromide of ammonium.

In this connection we may quote the statements of Botkine, already published in the THERAPEUTIC GAZETTE, p 629, 1888, as to the analogy between the action of salts of potassium, lithium, rubidium, and cæsium. It was there mentioned that the difference between the action of the salts of these different bases and those of potassium is in most respects purely quantitative, the salts of rubidium acting more energetically than those of cæsium, and more nearly approaching in their action the salts of potassium. This was, perhaps, to be expected from the fact that potassium, lithium, rubidium, and cæsium have been placed in the same chemical group, and we would, therefore, expect, if physiological action depends upon chemical analogy, that the salts of this group would act in the same manner.

The bromide of rubidium and ammonium is a white or slightly yellowish crystalline powder, with a taste that is at first slightly alkaline, but later bitter and salty. It is readily soluble in water. Its formula is, $RbBr_3(NH_4)Br$. The remedy was employed in twenty-two cases, of which twelve were cases of epileptic psychosis, five cases of genuine epilepsy, two of hysteria, one of syphilis of the brain, one of tabetic paralysis, and one healthy individual, who was employed as a test case. In the epileptic cases, in thirteen instances, the number, quality, and duration of the attacks were favorably influenced, quite as favorably, in fact, as was the case with the other three bromide preparations. As a rule, the action of the bromide of ammonium and rubidium was about equal to that of the bromide of potassium in these cases; indeed, it is claimed to have exerted a more favorable action than that of any other bromine preparation.

From the small number of cases observed however, the author does not claim that he has positively established the value of this substance as a remedy. But his results are sufficiently encouraging to render further investigations highly desirable. Doses of 60 to 75 grains in the evening as a hypnotic and sedative gave satisfactory results. No unpleasant after-effects were ever noticed. He administered the drug in solution in water, with a little lemon syrup, in quantities of from 30 to 120 grains in the twenty-four hours.

Professor Laufenauer contributes a second paper on this same subject to the *Therapeutische Monatshefte* for August, 1889. The author states that he was led to the undertaking of this investigation by the fact that of the three alkaline metallic bases (potassium, sodium, and lithium) potassium is the most positive and lithium the least positive element; while, further, the potassium has the greatest atomic weight (39.04), while lithium has the smallest (7.01). He therefore draws the conclusion that the activity of these metallic bromides is in direct relationship to their positiveness and atomic weight. If this assumption be true, it would be likewise probable that, if we could form a bromine combination with an alkaline metallic base possessing a higher atomic weight than potassium, that the combination would possess greater therapeutic activity than the potassium bromide. Such metallic bases are found in rubidium and cæsium which have an atomic weight of 85.2 and 132.5 respectively. Professor Laufenauer states that he obtained five hundred grains of the pure rubidium bromide, and he tested the action of this salt on an epileptic boy, 14 years of age, who, while under observation for ten days under treatment, averaged two to three convulsive attacks each day. The rubidium bromide was then administered, commencing with 7½ grains daily, and increasing each day 7½ grains, until, finally, 30 grains were given daily, and continued until the supply of the medicine was exhausted. No influence whatever on the epileptic convulsions was apparent,—a fact which the author thinks might possibly have been attributable to the small doses and short duration of treatment necessitated by the limited supply of the drug.

From the great cost of the pure rubidium bromide, as we have already mentioned, the author was led to employ bromide of rubidium and ammonium.

If the author's conclusions are reliable, he is to be congratulated in having introduced another remedy for epilepsy. The author does not state whether the drug might be tolerated when the potassium salt has to be suspended, a fact which is barely possible, and which would greatly add to the value of the remedy.

CHLORALAMIDE.

TESTIMONY as to the value of chloralamide continues to accumulate. Hagemann and Strauss (*Berliner Klin. Wochenschrift*, No. 33, 1889), testing its use on six healthy individuals, found, as the only result, that in doses of from 15 to 60 grains, the sleep was about two hours longer than usual, and, on awaking, the persons felt perfectly natural, although two complained that slight headache was produced by it. These authors have nearly always succeeded in producing sleep within half an hour with a dose of 15 grains, and they advise that the use of this remedy should commence with this dose. They believe that its action in general is satisfactory, although they have met with several cases in which it proved without value.

The most careful study of the action of chloralamide is that of Dr. Eugen Kny, which was published in the *Therapeutische Monatshefte* for August, 1889. Dr. Kny states that he has been experimenting with this drug since the commencement of the year, inaugurating his studies with a number of experiments made on rabbits and frogs. Given in doses of from ⅓ to ½ grain, injected hypodermically in frogs, a condition of apparent sleep was produced, in which the reflexes, although not entirely suppressed, were greatly reduced, entire recovery occurring within two or three days. Rabbits which received 24 to 30 grains of chloralamide in the stomach fell asleep within twenty to twenty-five minutes, and after ten or twelve hours were again perfectly normal. After thus determining that chloralamide possesses the powers of a hypnotic, Dr. Kny's experiments were then first directed as to the influence of this substance on the circulation, since the greatest drawback attending chloral, otherwise so useful as a hypnotic, is its depressing action on the heart. From experiments made on rabbits in this connection the author determined that in comparison to chloral the influence of chloralamide on the blood-pressure is insignificant. Thus, in the author's experiments, the effect of chloral introduced into the stomach was to reduce the blood-pressure in the rabbit from fifty to eighty millimetres below the level before the experiment; while chloralamide, on the other hand, only produced a fall of seventeen millimetres, or not more than might be expected to occur in normal sleep.

Passing from these experiments to studies made on man, Dr. Kny publishes notes of thirty-one cases in which more than one hundred doses of chloralamide were given for insomnia, each dose varying from 25 to 60 grains. As the author's purpose was to compare the action of chloralamide and chloral, only those forms of insomnia were selected in which it had been already determined that chloral gave the best results; in other words, cases of simple insomnia. Thus, in a case of violent delirium, both chloral and chloralamide failed; on the other hand, in a long list of cases of nervous origin, not characterized by excessive excitement, the results attained were quite as good as followed the use of chloral. This also applies to two cases of chronic alcoholism, and to a patient, addicted to morphine, who was suffering from tabes dorsalis; in cases of insomnia from organic affections, such as occur in phthisis, pleurisy, three cases of heart-disease, and four patients with moderately severe neuralgia, chloralamide succeeded in overcoming insomnia. Dr. Kny claims that chloralamide may be given without danger to old people; but, as is the case with chloral in severe forms of peripheral irritation, or in violent cough, severe headache, or intercostal neuralgia, but little relief may be expected. Dr. Kny also places the effectiveness of chloralamide, as compared with chloral, as thirty grains of the latter to forty-five grains of the former. Its action is also somewhat tardy, twenty to forty minutes, or an average of half an hour, being required to produce decided effect; while the influence of chloral is usually perceptible in fifteen minutes. The sleep produced by chloralamide is deeper than that of chloral, and will vary, according to individual peculiarities, from six to ten hours, the patient waking in the morning with clear head and free from any digestive disturbance. In this latter property the author finds the chief recommendation for chloralamide; in other words, that it has practically no influence

on the mucous membranes. Thus, even when placed in ten per cent. solution on the conjunctiva, it has no effect; while a similar solution of chloral will produce severe congestion. This relative freedom from irritating properties may also be seen in comparing the taste of the two substances, for the latter is so free from any disagreeable taste that it may be readily taken in powder form, even without being surrounded by capsules. A favorite method with the author is to administer it in red wine, to which a little sugar has been added. More important than these advantages, in our opinion, is the absence of any influence on the heart produced from the administration of chloralamide. If these statements as to its freedom from danger, and activity as a hypnotic, are confirmed, chloralamide is certainly a valuable addition to our armamentarium.

The action of chloralamide is explained by Dr. Kny as due to the fact that from the free alkali of the circulating blood the chloralamide is gradually split up into chloral and formamide, and thus but small quantities of chloral become effective at any one time. This statement, the author informs us, is confirmed by the fact that he was able to detect large amounts of uro-chloralic acid in the urine of a dog which had taken 180 grains of chloralamide. Further, a point which seems to be in favor of the use of chloralamide, is that formamide acts as a stimulant to the vaso-motor centre in the medulla, and thus tends to elevate blood-pressure. Dr. Kny prefers chloralamide to sulphonal principally upon the testimony of the patients themselves, and upon the fact that it is much more rapid in its action.

Some observations which have recently been made in the Clinic for Nervous Diseases at Halle seem to indicate that doses of 45 grains of chloralamide cannot be exceeded without leading to unpleasant effects. Two young women, in a perfect state of health, each received at four o'clock in the afternoon 60 grains of chloralamide. Within an hour each complained of dizziness. In one a condition closely resembling intoxication was produced, great excitement, and continuous talkativeness, while the other complained of unpleasant giddiness and staggering, with headache, especially in the posterior part of the head, nausea, and inclination to vomit. The greatest intensity of these unpleasant symptoms was reached about three hours after the administration of the drug. In one of the cases the stomach was washed out, and found to be entirely empty, although this procedure did not succeed in arresting nausea. With the exception of some slight increase in frequency, there was no change in the pulse worthy of mention; and the next day, with the exception of slight dizziness and moderate pain in the back of the head, all the above symptoms have disappeared. These cases appear to show that only in exceptional instances should the dose exceed 45 grains. In other respects the studies made in one hundred and ninety-six different instances in the clinic on forty-one different patients appeared to warrant the conclusion that chloralamide is a valuable addition to our list of remedies. That in many cases, especially in simple insomnia, it will produce a good sleep without any hurtful influence upon the circulation, respiration, or digestion, and with relatively slight unpleasant subjective after-effects, while on account of its freedom from disagreeable taste it is readily administered. It is not, however, to be regarded as a hypnotic which will invariably succeed in producing sleep, since, in many instances, it may entirely fail, in others the sleep may be very late in making its appearance, while, finally, in certain cases, and with large doses, the after-effects are decidedly annoying.

THE BLOOD-TAX OF INDIA.

RECENT official publications of the government of India show that last year five-and-twenty thousand human beings were killed by snakes and wild beasts out of a population of about two hundred million. This number is in accord with the past, and may be looked upon as a regular life-charge upon the country. Human life is so cheap in India, however, that perhaps the destruction of property is more felt by the natives. Thus, in 1887, more than sixty thousand head of cattle were destroyed.

The snake is the chief enemy to the human animal, killing annually about twenty thousand people. Of the wild beasts, the tigers and leopards are estimated together to kill about twelve thousand people and fifty thousand cattle, the higher game being especially the food of the bigger cat. Most of the snake-poisoning is the result of an accident. The serpent strikes when trodden on or otherwise interfered with, and is rarely the first aggressor. But one snake—the *Ophiophagus Elaps*, of India—assails and charges man even more savagely and actively than does the tiger himself.

A feeling of blame against the British rulers is the first emotion which such statistics as these give origin to when read; but the problem is so complex and difficult that its present solution seems impossible. The tiger and leopard ought to be exterminated, although some English lovers of sport urge that they should in fact be protected, and that there should be a "close time" when killing of them should be unlawful; but the chief difficulty is with the snake. He permeates the land,—denizen not only of forest, jungle, and hill-side, he haunts the cities, nestles in the habitations of men and beasts, roams over fields, roads, and gardens,—an ever-present spectre of death. Only by a determined, persistent uprising and continuing battle of a whole people could his numbers be distinctly lessened. But in some places the old serpent-worship lingers, and the Hindoo greets the snake rather as a friend, or honors him as a guest, to be reverenced as well as feared.

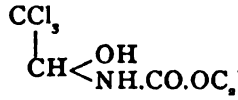
Sir Joseph Fayrer believes that there ought to be a special governmental department having charge of this matter, although he himself writes, "The people should bestir themselves." The apathy of the Hindoo seems, however, unconquerable. The tiger and leopard eat the Hindoo, his family, his cattle; the bear and wild boar assault him; the wolf, the cowardly hyena, and the mere jackal lie in wait for his children and other feeble folk, while every hour of the day and the night the snake strikes him with speedy and certain death. Yet he bows his head as though helpless and doomed of the gods. The Anglo-Saxon energy may, perhaps, be able to awake him, but we very much doubt it. Is it also not possible that the terrible struggle for the mere necessities of life in which the Hindoos pass their existence, has engendered a sort of race instinct that the land is so overcrowded that death of individuals is better for the mass, and so infanticide is encouraged and the annual tribute to the minotaur of wild beasts paid with indifference if not with willingness.

ANTIPYRIN IN DIABETES INSIPIDUS.

SINCE the publication of a note by Eichhorst, who reported the case of a man, 38 years of age, suffering from diabetes insipidus, in whom the daily amount of urine was reduced from thirteen quarts to normal by the administration of seventy-five grains of antipyrin daily, the value of this remedy in diabetes insipidus has been the subject of considerable discussion, and in the THERAPEUTIC GAZETTE for June 15, 1889, we alluded, in discussing the value of antipyrin in diabetes mellitus, to the fact that the remedy had also been claimed to reduce the renal secretion in diabetes insipidus. The usefulness of antipyrin in the latter affection has been still further strengthened by the report of three cases published by Dr. M. Opitz in the *Deutsche Medicinische Wochenschrift* for August 8, 1889. These cases show that after the prolonged but fruitless employment of numerous other remedies the subjective symptoms of diabetes insipidus, as well as the amount of urine eliminated, yielded to the administration of antipyrin. In one of these cases a permanent cure was said to be obtained; in another the cure persisted some time after the suspension of the drug; while in the third case the amount of urine returned to its original volume after the cessation of the use of antipyrin, but was again reduced to normal when the drug was readministered. With this reduction in the amount of urine secreted there was decrease in thirst, improvement in the general feelings, increase in the body-weight, and undisturbed sleep returned. These cases seem to show that the result was directly attributable to the antipyrin, for in one case the disease had lasted more than twenty years, and had been rebellious to the most varied forms of medication, while in another the amount of urine eliminated daily reached the enormous quantity of sixteen quarts, and was yet cured by the use of the drug.

THE THERAPEUTIC AND PHYSIOLOGICAL ACTION OF URALIUM.

IN the THERAPEUTIC GAZETTE for May 15, 1889, we referred to the claim advanced by Dr. Poppl as to the value of a combination of chloral and urethan as a hypnotic. The author has continued his researches, and communicates his results to the *Pharmaceutische Post* for July 14, 1889. According to the author uralium is formed as follows:



The compound occurs in the form of bitter crystals, readily soluble in alcohol, and with difficulty soluble in water, and in doses of from 12 to 14 grains for every two pounds of

body weight, given by the mouth to dogs, almost invariably produces sleep within one or two hours, lasting for from five to ten hours. In these doses the pulse is increased in frequency, while the temperature is reduced from 2½° to 3½° F.

The author states that uralium is less dangerous than chloral, from the fact that it reduces the temperature to a less degree, and has scarcely any influence on the vascular system. He has experimented with this remedy on himself, taking from 15 to 30 grains in the evening, his pulse being increased only from 75 beats to 80 in the minute.

There was marked somnolence, but the duration of the sleep produced was no longer than usual, and on awakening there was a slight sensation of fatigue, which, however, rapidly disappeared.

Finally, the author states that he has given uralium to a large number of cases (inebriates, phthisical cases, and cases of heart-disease, and various affections of the nervous system) in doses of from 30 to 45 grains, and has almost invariably succeeded in producing sleep.

Under its use, even when repeated on a number of different occasions, the blood-pressure was not reduced either in healthy individuals or in patients to whom it was given to overcome insomnia, an attribute which is certainly in its favor when compared to chloral.

ESERIDINE AS A LAXATIVE

ESERIDINE in chemical composition closely approaches its congener eserine or physostigmine, into which it may be transformed under the influence of heat and weak acids. According to the *Journal de Médecine de Paris*, July 14, 1889, in medicinal doses it produces marked diarrhœa, without any appreciable action on the central nerve system. Its poisonous doses are six times larger than that of eserine, while it is claimed to act as a reliable laxative in therapeutic doses.

Reports on Therapeutic Progress.

THE TREATMENT OF CHOREA BY PROLONGED SLEEP.

It is well known that almost invariably the movements of chorea are arrested during sleep, so indicating a simultaneous arrest of the disordered action of the nervous centres upon which these movements depend. By greatly prolonging this period of rest we may accomplish two things,—first, we may cut short the mischief which is almost inevitably being done to nerve-centres by the maintenance of this incessant and unnatural activity; and, secondly, during such periods of prolonged rest we afford an opportunity for the gradual abatement of the functional perversion in certain parts of the nervous system (wheresoever situated) which has been the primary cause of the malady. Such a restoration of the normal equilibrium of functions, under the influence, as our forefathers would say, of the *vis medicatrix naturæ*, is the main object of this method of treatment. It is a mode of treatment which is, however, applicable only to certain aggravated cases of chorea. From the point of view of etiology and of symptoms chorea and hysteria are sometimes closely related, and a case reported by Dr. H. Charlton Bastian in the *Lancet* for July 13, 1889, presents many points suggestive of the existence of a hysterical factor, especially in its initial stages.

The patient was a nursemaid, aged 20, who came under Dr. Bastian's treatment, complaining of general and severe choreic movements, and of headache and pains in other parts of the body. The choreiform movements only commenced about eight months before the patient came under Dr. Bastian's care, but there was a history of fainting attacks and giddiness for five years before, dating from a severe fright to which she had been subjected about that time. The chorea came on in the evening of a day on which she had been out with the "Salvation Army,"—a fact which still further points to the analogy between this affection and hysteria. She had been under treatment by massage and galvanism, her head and back sprayed with ether to relieve the pains, but no permanent relief was obtained. When she was admitted to the University Hospital, under Dr. Bastian's care, she stated she had never been so bad before. The patient at that time, while lying in bed, had a peculiar expression of face, the eyelids twitching when she looks up, which is seldom, and only for an instant when spoken to; the cheeks are somewhat flushed, and the lips move naturally in speaking. There is no paralysis of any face muscle or eye muscle. The mucous membranes generally have a healthy color. The skin is rather moist. The patient is generally well nourished. Usual temperature in the mouth, 99°. The movements, as she lies in bed, affect both hands and arms, as well as both legs. Those in the right hand are the most marked, and those in

the right leg the least of all, the latter being at times scarcely noticeable. When she attempts to stand or walk (which is scarcely possible even with assistance) the movements become general and very violent, even the head being moved up and down by the neck muscles. The movements are increased when she is being watched, but never cease at any time when she is awake. During sleep, as a rule, they cease entirely, though once or twice a slight tremor has been noticed. By an effort of the will the movements can be slightly lessened; they are all rapid, regular, and rhythmical. The movements of the hand consist of rapid flexions and extensions of the fingers (the general position being one of slight flexion), with adduction and abduction of the thumb. These are accompanied by rapid and more marked flexions of the wrist, less extensive but equally rapid flexions of the elbow, and when she is excited slight movements also at the shoulder, abducting and adducting the arm. All the movements of the hands and arms increase in violence when the patient sits up or when she puts out her tongue. The movements in the legs are present at the hip, knee, and ankle, and consist of rapid flexions of each. The general position of the hip and knee is one of very slight flexion, and this is much more marked in the left than in the right leg. Headache is almost continuous, dull, but with occasional exacerbations, usually frontal, though sometimes it is occipital. There has never been any vomiting, and only occasional nausea. The pain in the lumbar region is a dull aching, as is also the pain in the left iliac region. There is tenderness on pressure in both these places. Sleep is bad, and has been so for months, except after a night draught. Her mind is clear, and her memory seems good. The sight is fairly good, but the visual field is concentrically narrowed in both eyes. Pupils equal, of medium size, reacting to light and accommodation. The ophthalmoscope reveals nothing abnormal. There is no anæsthesia or rigidity anywhere. Both knee-jerks are somewhat exaggerated. A marked *tache cérébrale* is obtainable on the abdomen. The patient has been subject to shortness of breath on exertion, and palpitation when excited. The heart's apex-beat can be felt in the fifth space. There are no cardiac murmurs, the sounds being normal. Pulse regular, from 100 to 108 per minute. No cough. Voice natural. Respirations rapid, more especially when they are being counted,—48 per minute. Percussion-note good all over the lungs. Nothing abnormal in the respiratory sounds anywhere. Tongue pretty clean. Occasionally there is a little feeling of nausea; no vomiting. Appetite shortly after admission good. Bowels very constipated, never open without medicine, and sometimes requiring an enema as well. There is pain in the epigastrium sometimes soon after taking food. Menstruation began at the age of twelve; it was never regular, and the patient has not menstruated for the last seven months. Previously the flow had frequently lasted for two months. Her urine contains neither albumen nor sugar.

Synopsis of Notes concerning Management and Progress of Case.—The patient, being admitted on February 25, was kept at rest in bed. On February 27 she was ordered a mixture containing four minims of liquor arsenicalis, fifteen grains of bromide of potassium, and ten minims of spirits of chloroform in an ounce of water, to be taken three times a day; also, a five-grain pill of aloes and myrrh every morning. At the end of a week from admission there was almost no improvement. On March 4 she was prescribed twenty grains of chloral hydrate and ten grains of bromide of potassium, to be repeated on awaking; the patient to be allowed only half an hour awake at a time for the taking of nourishment; the sleeping draught to be used as seldom as possible. At first the draught was required every four hours; later on, sometimes the patient slept eight hours without awaking, but on an average she was given it every six hours. The light near the patient was lessened, screens were drawn round the bed, and quiet was observed as far as possible. Her food was beef-tea or mutton-broth, about a pint and a half, milk about the same amount, and usually two eggs beaten up with the latter, during the twenty-four hours. To relieve the constipation, 45 minims of the liquid extract of cascara were given every night, with (if needed) an enema in the morning. (The bromide was added to the chloral on the second day to relieve the headache she complained of on awaking.) During the sleep thus induced the patient's tremor ceased, except when some noise disturbed her a little, though once or twice slight movements of her knee and hand were seen when the ward was quite quiet. These movements during sleep grew rarer towards the end of the fortnight. In her waking intervals, which sometimes exceeded half an hour, but which were kept as nearly as possible to that time, the movements of all the limbs became gradually less; but she complained greatly of headache, especially if any light fell upon her eyes. She was also very emotional, crying at times. But she took

her food well, and the medicine kept her bowels fairly regular. Her temperature varied during this sleep from 99.6° to 95.4° (the latter temperature only being registered once at about 2 A.M.). Her pulse varied from 70 to 102, and her respirations from 20 to 52.

March 18.—She was allowed to awake. The movements were distinctly less marked and extensive. She complained much of headache, and was ordered some medicine for its relief. Her breathing was rapid and shallow, 60 per minute; her pulse regular, 84, rather compressible. On the 25th, the patient's headache being better, although the pain in the epigastrium and back remained, sleep was again induced as before. Her appetite remained good. The movements during the waking intervals grew less and less, and the headache was not so severe as it had been previously. During this second sleep, which was of three weeks' duration, her temperature varied from 96.7° to 99.6°, her pulse from 70 to 114, and her respirations from 30 to 60. These records as to pulse and respiration (like those previously given) apply to the brief waking intervals; but during this second period observations were also made as to pulse and respiration while the patient was actually asleep. Both were found to be distinctly slower and more natural at these times than they were during the waking intervals. Thus, the average of sixteen observations of this kind gives for the pulse 70, and for respirations 30. It should be recollected, moreover, that during the first week of her stay in the hospital, before she was put upon the chloral treatment, her pulse was mostly 100 to 108, and her respirations 48.

April 16.—She was again allowed to awake. The movements in the legs were gone, except very slight tremors now and then. The hands also were much quieter; the left almost quite still, except on excitement. Pain still felt in stomach and back. Headache still rather bad. Appetite not very good. Bowels regular. Her mental condition was confused; she cried and made unfounded statements. She was in consequence ordered a mixture, consisting of fifteen minims of nepenthe, twenty minims of orange tincture, and an ounce of compound infusion of gentian three times a day. This disturbed mental condition lasted more or less for thirteen days. She cried and was often much depressed, imagining that she had committed great fault when she first came to the hospital. She also had fancies at times that others were talking and plotting against her. During this period, however, she menstruated, so that the mental disturbance may have been intensified and prolonged by this cause. On the 29th she was mentally clear and cheerful, but unable to recollect what had happened during the previous week. On May 8 she was quite cheerful; could walk, though not quite steadily; and could knit easily, tremor existing only to a slight extent in the right hand. Bowels regular; appetite good.

She slowly improved during the next fortnight, when she was discharged with slight tremor in the right hand only. During the whole time she was asleep her general nutrition was well maintained; her cheeks and lips continued of good color; there was no sickness. Her tongue remained quite clean throughout, and she took her food well. The urine and motions were passed into a bed-pan, and there was never any incontinence.

Dr. Bastian said that, during the last twelve years, he has treated some eight or nine cases of chorea in this manner, some being notably improved, other very chronic cases, however, not deriving from it much permanent benefit. In no case, however, has any evil resulted from the treatment, and, up to the present instance, he writes, that he has never heard patients complain of headache during its continuance, and he has consequently never before had occasion to give bromide of potassium in combination with the chloral. The record of this case appears to show that no harmful effects were exercised upon the patient by the large quantities of chloral which she had taken in order to maintain sleep during these two periods of two and three weeks respectively.

In deciding as to the class of cases in which this treatment might be considered advisable, Dr. Bastian states, in the first place, that in ordinary cases of chorea, he never thinks of having recourse to it. With rest and various kinds of treatment, in the course of six to twelve weeks, such cases recover. Then, again, in the most acute and severe cases of chorea, in which the temperature is raised, and the movements are violent and continuous, with or without delirium or maniacal symptoms, he has never yet tried this mode of treatment, and should not recommend its adoption. Dr. Bastian thinks that this plan of treatment is especially applicable to the class in which there is no fever and no heart-disease, but where the movements are unusually severe and continuous, and have so continued for months and years without abatement. A hysterical element is no contraindication to the employment of this treatment, provided the movements cease absolutely during sleep.

Nothing of a curative nature can be attached to the use of the chloral. Paraldehyde might otherwise be suitable, but it is too nauseous to the taste. Sulphonal might, however, prove as efficacious as chloral. Whichever medicine be used, however, the great object should be to give no more than is absolutely needed to maintain the continuous sleep, and therefore all accessary means, such as quietude, slightly darkening the room, the expeditious administration of fluid nourishment five or six times a day whenever the patient awakes, and the use of the bed-pan, should be had recourse to. The period in which the patient is awake should, as far as possible, not exceed half an hour at a time.

KOUMISS, KÉFIR, AND MATZOON.

The various preparations of fermented milk are being now so generally used, that we reprint in full a paper recently published by MR. AD. TSCHEPPE in the *American Druggist.*

KOUMISS is generally designated as fermented milk. As this term implies the meaning of alcoholic fermentation, the definition is incorrect, since lactic fermentation has as much share in shaping the final result, by acting on both the proteid substances and sugar, as vinous fermentation does. It is not even the sugar contained in the milk which is attacked by the ferment which induces alcoholic fermentation, for the product of its fermentation is furnished by sugar foreign to milk, purposely added to it. Koumiss may, therefore, more properly be defined as being obtained by alcoholic fermentation of sugar, not *of* milk, but *in* milk.

The various phases of the process which take place in the formation of koumiss, and the changes which the constituents of milk must undergo, may be thus briefly stated:

Some sugar is added to milk, then brewers' or cake yeast (grocers' yeast), and the mixture is left to itself. In the course of time, varying in length according to temperature, the effects of alcoholic and of lactic fermentation make themselves apparent, the first by evolution of gas, through the splitting up of some of the sugar into alcohol and carbonic acid, of which the latter is the most conspicuous; the lactic fermentation, by the appearance of lactic acid, generated through a rearrangement of the atoms in the sugar molecule, and in the influence of lactic ferment, which transformation manifests itself by throwing the casein out of solution.

While albumen may be considerably acidulated without losing its solubility, casein, as an alkali-proteid, is soluble only in slightly alkaline solutions, and is extremely sensible, in this respect, towards acids. If lactic fermentation is so far progressed that neutrality is passed, the casein is thrown out as a coherent jelly, which, when undisturbed, becomes more compact by contraction and expulsion of serum, and finally conglomerates into separate fibrous lumps, which cannot be divided any more. But if this gelatinous precipitate is agitated ever so slightly in the incipient stages of its formation, it is readily broken up into an impalpable cream, which may be kept finely suspended in the liquid for a length of time, if the necessary conditions of temperature are observed.

If the generation of carbonic acid gas has been lively enough before the lactic fermentation produces its effects, or if it is aided by occasional shaking of the bottles, all the butter-fat is enveloped in the precipitate of the casein without affecting its divisibility. Hence the function of the carbonic acid gas is this, that by the expansion and mobility due to its gaseous nature, it reduces the casein to the finest possible condition, much finer than other mechanical means can do. When the precipitation and division of the casein are effected, and enough carbonic acid gas is found to cause lively effervescence, the koumiss is ready for use. The time in which this is accomplished depends on conditions of temperature at which the fermentation takes place, and on the proportions of the additions. Upon the observance of the most favorable conditions depends also the quality of the product, and it is here where the formula and the directions given in the National Formulary need a correction, in order to obtain an irreproachable preparation of koumiss.

A. *Addition of Sugar.*—Milk-sugar is not readily attacked by yeast. Contrary to statements in books that vinous fermentation will set in after the milk turns sour, and that thereby the milk-sugar becomes changed into glucose, I find that milk more easily enters fermentation under an addition of an alkali, by which the souring is prevented. The same is the case with cane-sugar; and, as it is desirable to have the alcoholic fermentation started before the lactic fermentation acts on the casein, the addition of fermentable sugar, in the shape of grape-sugar

or honey, is indicated. Its quantity must be regulated according to requirements only. Nothing is more annoying to the unwary consumer than the opening of a bottle of overcharged koumiss, which generally results in the spattering of its contents promiscuously about the room. The quantity prescribed in the National Formulary for two pints of milk is amply sufficient for two gallons, and may only be increased for koumiss dispensed in patent bottles, or if drawn from ordinary bottles by means of a tap.

B. *Temperature.*—The temperature prescribed in the formula may turn out to be disastrous in the manufacture of koumiss.

Milk is a peculiarly complex preparation. It is not an emulsion, as sometimes stated in books, but contains the fat enclosed in separate cells, which rises to the surface as a layer of cream if milk is left in undisturbed repose or subjected to centrifugal force. Boiling does not burst these cells or separate the fat; but if milk is left for hours at a temperature above the melting-point of butter-fat, 65° F., or if subjected to violent commotion, such as churning at the same temperature for a short time, practically all the fat is separated. Again, if casein is precipitated from fresh milk by means of acids, at any temperature, it encloses all the fat in its meshes, and also the jelliform casein separated from the milk by rennet includes the butter firmly. But if milk is allowed to turn sour, the fat separates from the casein readily by keeping it a short time at temperatures above the melting-point of the butter-fat. At the same time the finely-divided casein conglomerates into more compact lumps, and the koumiss is spoiled.

Although milk, as long as it is sweet, may be kept at 90° F. with impunity, this same temperature is deleterious to the product after souring sets in. The casein turns lumpy, and the fat may be seen floating in the neck of the bottle as a yellow mass. This temperature is unnecessary for the manufacture of koumiss. Vinous fermentation takes place at much lower temperatures, and the higher degrees only favor the lactic fermentation by which the koumiss gets too acid to be drunk by the bottleful.

The sugar is not all consumed by either kind of fermentation. If milk is allowed to turn sour, only one-tenth to one-eighth part of its sugar is changed to lactic acid, and also the vinous fermentation stops before all the sugar is used up. But the lactic fermentation goes on slowly, acting on the sugar which is left, and the koumiss turns more and more acid the longer it is kept. Pretty old samples of koumiss still react on Fehling's solutions.

In place of preparing koumiss with sweet milk, and waiting until it turns sour, the casein may be precipitated at once, by the addition of one-third of ready koumiss to fresh milk. Yeast is not necessary, but sugar must be added to produce enough carbonic acid gas to cause effervescence.

Koumiss may be also made from sour milk, freed of its crust of cream, by breaking up the gelatinous mass by vigorous concussion, and causing alcoholic fermentation by addition of sugar and yeast. This preparation would be nearly devoid of cream, but a proportion may be brought in by addition of sweet milk.

The time in which koumiss becomes ready for use depends as much on the quantity and activity of the ferment as on the temperature. With plenty of yeast and a prevailing temperature nearer to 90° than 60° F., the course of fermentation may be said to be even stormy, and the process is completed in as many hours as days may be consumed when the temperature is kept lower. But it is safer to operate at a lower temperature, by which a much finer product is obtained. Besides, by a slow after-fermentation the koumiss becomes ripened, and in the course of one or two weeks a cheesy or butyraceous flavor is acquired, which is generally regarded as a necessary characteristic of good koumiss.

Commercial preparations of koumiss never correspond to fully undiluted milk. Koumiss made from undiluted milk is too rich, and requires too great care to be practicably handled by the large manufacturer. But the pharmacist, who disposes of his own production directly to the customer, may easily take the necessary precautions against disastrous influences, and may give his customers the benefit of an undiluted preparation, which koumiss is supposed to be.

Samples of commercial preparations of koumiss I found to be either more or less deficient in cream, or to be made from watered milk, or both. Dr. Brushe's koumiss, for instance, commanding the largest sale in New York, gave, on analysis, only two-thirds of the casein and fat in the proportions in which they exist in milk, indicating a corresponding watering of the milk.

KÉFIR.—This is a fermented milk beverage, identical with koumiss in its finished state. It differs from the latter by being

produced by aid of a different ferment. The kéfir ferment was originally brought from the Caucasus, but may be procured in this market from home culture. It comes in the shape of grains of various forms and sizes, very much resembling bits of the inflorescence of cauliflower, constituting a compound fungus growth, resulting from the cohabitation of a fleshy fungus with a certain species of saccharomyces, which latter alone plays the active *rôle* of enacting vinous fermentation of the saccharine constituent of milk. This peculiar saccharomyces differs from the brewer's yeast by starting vinous fermentation without addition of a fermentable sugar, and fermentation progresses to a certain advanced degree while the milk is yet sweet, or before lactic fermentation produces its effect. It is, therefore, possible, to obtain an effervescing koumiss by its aid with a much less degree of acidity than that obtained by the saccharomyces cerevisiæ, and it may be concluded that the kéfir yeast is better adapted for the fermentation of milk than beer yeast is. By after-fermentation the same degree of acidity is reached as in koumiss obtained through the action of ordinary yeast. This peculiarity has led to a distinction in the use of the different stages of the fermentation of kéfir, as it has been observed that young kéfir which is yet sweet acts as a slight purgative, while an older, or more acid, or "stronger" kéfir exerts a constipating effect on the bowels, and is less easily borne by delicate stomachs.

Kéfir koumiss is prepared by adding active kéfir grains to milk, preferably kept at a temperature between 70° and 80° F., until the effect of fermentation becomes apparent by the rising of the grains to the surface, being carried upward by bubbles of carbonic acid gas attached to them. The grains may then be strained off, and the milk, which now contains enough yeast-cells to insure the continuance of the fermentation, left to itself in well-corked bottles.

As the yeast-cells propagate themselves, more fresh milk may be added previous to bottling.

The directions accompanying the kéfir grains direct that the grains should be left in the milk until the casein separates from the serum, and that this strained product shall be used as the ferment of about four times its bulk of fresh milk. (Several prominent houses who sell kéfir grains accompany them by printed directions, which fail to start their activity together.)

If kéfir is once obtained by this means, the further production may be simplified in the same manner as in the case of koumiss, by adding a quantity of ready kéfir to a multiple of fresh milk, and this may be continued through many generations without having further recourse to the original kéfir grains.

The printed directions recommend the employment of milk previously boiled. The advantage of this proceeding is supposed to be this, that the lactic fermentation is retarded, to which end a washing of the kéfir grains with a two per cent. solution of carbonate of sodium is prescribed for the removal of the rest of lactic acid tenaciously retained by the grains.

Commercial kéfir grains may be found to be quite inert by the buyer uninitiated in the art of developing them properly. The fact is, that their activity must be first started, and directions to do so are given with the samples; but, in spite of following them closely, they may fail to give satisfactory results. The secret of success seems to me to be to keep the grains in fresh milk at a temperature of 70° to 80° F., and to change the milk once or twice daily, or as often as the milk threatens to become sour. The time may have to be extended to a week, until their action becomes manifest by the generation of gas.

Kéfir grains are also apt to decay, and those inert grains have to be removed. Those which retain their vitality may be recognized by their turgor or toughness to the touch, while the decayed ones crumble between the fingers like soft cheese.

The usefulness of koumiss as a dietetic hinges upon the fine division of its casein. Indeed, if a well-prepared koumiss is subjected to digestive influences, the finely-divided and diffused precipitate of casein dissolves at once, while the floccular casein, otherwise obtained, resists the peptic action remarkably long.

Matzoon.—Matzoon is a peculiar milk preparation, also stated on the label to be fermented milk, although there is no evidence of its having undergone alcoholic fermentation. It is devoid of gas, and appears as a viscid liquid, showing a rather coarsely granular mass of precipitated casein, well suspended in a serum which corresponds to that obtained from sour milk. Although betraying great richness from its appearance, the analysis gives an amount of casein as corresponding to undiluted milk and two-thirds of its cream.

One fluidounce of cow's milk contains grains (average).		Koumiss from milk.	Dr. Brushe's koumiss.	Matzoon.
Sugar	22	...	...	20
Casein	14	14	10	14
Fat	15	15	9	7
Lactic acid	...	1.5	3	.1

Glucose. Lactic acid.

$$C_6H_{12}O_6 = 2HC_3H_5O_3$$

Glucose. Alcohol.

$$C_6H_{12}O_6 = 2C_2H_6O + 2CO_2$$

Glucose yields by fermentation—

	Per cent.
Alcohol	48.5
Carbonic acid	46.5
Glycerin	3.6
Other products	1.4

THE TREATMENT OF ECZEMA.

DR. UNNA, of Hamburg, publishes in the *Monatsschrift für Dermatologie* a paper on the "Diagnosis, Etiology, and Treatment of Eczema." He says that even before the experimental cultivation of bacilli exact clinical observation had distinguished a number of entirely different types of eczema, and he thinks that each different type will be found to require a different mode of treatment. The type most frequently seen in Hamburg is seborrhœic eczema, and the parasite causing it is the same which in the first instance produces pityriasis capitis. Those persons who suffer from seborrhœic eczema of the head, including those affected with pityriasis capitis, are apt to suffer from the same kind of eczema on other parts of the skin. Dr. Unna has repeatedly pointed out that we possess a series of valuable remedies for the treatment of seborrhœic eczema in all its forms,—viz., sulphur, resorcin, chrysarobin, and pyrogallol. Of these remedies resorcin is the best, as being the least likely to produce local or general ill effects. It may also be used in an alcoholic or watery solution, or in the form of ointment, paste, soap, or powder. Dr. Unna's favorite formula is a soluion of three drachms of finely-powdered resorcin with an equal quantity of glycerin in six ounces of spirits of wine, diluted with four times the quantity of water or camomile tea. A thin layer of cotton-wool well moistened with the solution is applied, covered with some water-proof material, and fastened by a bandage. These applications are particularly useful when the treatment is prolonged, or when it is carried out by night. They are, of course, impossible in general eczema of adults, but not in that of infants. Dr. Unna describes an especially important effect following the application of resorcin,—viz., a swelling of the epidermis, by which all painful fissures are healed in a single night. In order to insure healing, he advises that the skin should be anointed after the removal of the bandage, and that washing with soap should be avoided. A few people suffer from a resorcin idiosyncrasy which necessitates the immediate cessation of this treatment, and the application of powder to the affected parts. This idiosyncrasy is, however, very rare, as he has only met with it ten times in five years' observation, during which time he has seen two thousand cases. He remarks that his treatment is not adapted to those cases of long-existing eczema, in which strongly-infiltrated or thickly-indurated patches occur.—*Lancet*, August 17, 1889.

THE THERAPEUTICS OF RHEUMATISM IN INFANTS AND CHILDREN.

At a meeting of the Medical Society of the County of New York, held May, 27, 1889, DR. A. JACOBI, in a paper with this title, opened by calling attention to the frequency with which rheumatism occurred in children and infants (*New York Medical Journal*, August 24, 1889). Valvular affections of the left side of the heart were usually secondary to rheumatism, and not to scarlatina. Many cases of rheumatism in children did not develop cardiac symptoms; but, on the other hand, endocarditis was sometimes the first symptom of rheumatism, even in mild cases; the two facts contrasted strongly and must be borne in mind. The slightest symptom of chorea minor should lead to an examination of both heart and joints. Chorea minor due to a rheumatic affection of the spinal membranes might be, not the final, but the earliest symptom of rheumatism and rheumatic endocarditis. "Dentition," "malaria," "worms," or "colds" were too often the diagnoses given in cases of rheumatism in children. This was partly because an idea of the rare occurrence of the disease in children was rooted in the minds of many practitioners, and partly because diagnosis was sometimes quite difficult. Fever in small children was a common symptom, but every disturbance in a child was apt to raise the temperature. The elevation of temperature in rheumatism might be slight and irregular. Swelling of the joints was apt to be trifling in amount

and easily overlooked; and the pain (spontaneous or on pressure) might be much less severe than pains due to fatigue, rachitis, syphilis, colic, or otitis. In every doubtful case, where a child showed signs of discomfort, safety required that the heart and joints should be examined. Diagnosis was especially hard if only a single joint, such as the hip or knee, was affected. Other joints might become involved subsequently. But too often such a condition in a young child, requiring really careful and repeated examinations to determine correctly, was almost disregarded by the physician, and the mother was assured that the child's uneasiness was caused by "growing pains." He would emphasize the fact that in a large majority of cases the so-called "growing-pain" indicated the presence of rheumatism and the liability to irreparable heart injuries.

As regarded treatment, a change of residence from localities in which rheumatism was apparently endemic was often desirable. Alkalies were often indicated. Cold and moist weather, damp houses, etc., frequently brought on rheumatism in the children of rheumatic parents, and in such children treatment must be mainly preventive. The systematic use of cold water would modify, and sometimes entirely remove, such a tendency. A cold wash, sponge, wet sheet, shower-bath, or bath (according to the child's strength or power of reaction) should be given daily. If in any case this was followed by chilliness, then tepid water containing alcohol might be used at first. Warm clothing should always be worn for the remainder of the day after any cold-water application. Among the various local measures mentioned for the relief of swollen and painful joints, the speaker called especial attention to swathing of the part in cotton and flannel, and to the application twice daily of a solution of iodoform in collodion, brushed copiously over the swollen surface. For endocarditis, absolute rest, cold applications over the heart, and salicylate of sodium were to be recommended.

After referring to gonorrhœal articular rheumatism, nodulated rheumatism (*i.e.* the appearance of small neoplasms on tendinous and periosteal structures), and peliosis rheumatica (a localized form of purpura), which were occasionally met with, and required no special treatment in children, the speaker considered muscular rheumatism. In this form also the best preventive treatment, when a tendency to the affection had appeared, was the regular and systematic use of cold water. In certain cases the injection of a small dose of morphine, the use of the interrupted current, the administration of the salicylate, antipyrin, acetanilid, or phenacetin, and a few subcutaneous doses of $\frac{1}{15}$ grain of pilocarpine, had given relief. Where a real inflammation was present in a muscle, warm baths, a mild continued current, and small doses of the bichloride of mercury would aid in recovery.

Dr. W. H. Thomson said that many years ago his attention had been drawn to the etiology of rheumatism, he being then a medical student in Syria, and hearing from his father (then engaged in explorations) what seemed to him paradoxical statements relative to the prevalence of rheumatism among the Arabs of the desert. He had heard that acute rheumatism was as common a disease among the Arabs in the arid country south of Palestine as among the fishermen of Norway and Scotland. He had asked himself then and since what reason there should be for the appearance of a disease either identical or similar among peoples living under apparently opposite conditions of life, in respect to weather,—that is, in climates presenting the extremes of warmth and dryness and a never-clouded sky on the one hand, and incessant fog, rain, and chilly winds on the other hand. He had become satisfied that the cause of rheumatism in either case must be a common one, but not the same as the cause of gout, for gout was nowhere to be met with in Mohammedan countries, unless in the few sections where alcohol was used (as in parts of India, where a drink made from fermented rice was drunk); at least it was very rare. It was safe to premise that rheumatism, so far as climate was concerned in its causation, was connected with changes in temperature, while gout was the outcome of excesses in the diet and in the use of fermented liquors. What, then, was there in common in the conditions of life of a man living in a tent in a burning climate, never having enough water, and a fisherman on the shore of the Baltic drenched with water most of the time? He would answer, Chilling of the skin when moist. This might occur as well in the deserts of Syria as in lands covered with fog half the year round. In the desert there was great heat during the day, the sand became heated as if in an oven, and when a party of travellers lay down to sleep, some time after sundown, on this warm sand, they were in a profuse perspiration, and nat-

urally provided themselves with little in the way of coverings. But the sand radiated its heat very rapidly into the cloudless sky, and before sunrise bitter cold would succeed to the heat of the evening. Consequently the wet skins of the uncovered sleepers became badly chilled; and that rheumatism should follow such exposure was most natural. He had heard his father say that he had never suffered more from cold than just before dawn at the base of Mount Sinai.

No one should attempt to diagnosticate the early stage of rheumatism by an examination of its articular habitat, a joint. A swelling in a joint might be due to gout, trauma, gonorrhœa, or rheumatism; the symptoms in the joint were the same in each case, and so many mistakes were made. Examine the pulse, and no one familiar with the contrast presented by rheumatism and gout in this respect should fail to determine whether it was rheumatism which the patient had in the joint, or gout affecting the heart and arteries. In scarlatinal rheumatism the pulse was often hard, and there was often much uric acid present in the blood and urine; sometimes there was a formation of pus and true textural changes, which were absent in simple rheumatism, and often pyæmia was developed.

He was inclined to believe in the existence of some yet unknown function of the skin connected with respiration in its widest sense; he thought that a failure of skin-action of some sort was a means of causing the accumulation in the body of the matters which were morbific of rheumatism. Quinsy and acute articular rheumatism were sometimes associated, the latter following the appearance of the former. In the genesis of rheumatism there was usually a chilling of the skin, so naturally the warm bath acted as an anæsthetic; moreover, any bath rendered the urine alkaline,—even a vinegar bath. Flannel had a peculiar usefulness from first to last. Oily inunctions, and especially inunctions of cod-liver oil, were advisable for the same reasons. This oil had first been introduced as a remedy for chronic rheumatism, and he himself placed great reliance on its effects, both externally and internally.

As to the connection between rheumatism and endocarditis in children, he fully concurred in Dr. Jacobi's warning lest it be overlooked. Endocarditis, he wished to state emphatically, might occur with only the most insignificant indications of rheumatism. He had recently seen a fine boy suffering from only a moderate attack of arthritis with the temperature between 99° and 100°, or else normal; the disease had been contracted by sitting on the ground while watching a game of ball. In spite of all he could do, endocarditis had come on in thirty-six hours, and it would probably leave him with a permanently crippled heart.

To prevent injuries to the heart in children, contracted in this way, we must be on the lookout for the preceding rheumatism, and especially if chorea appeared, which was the normal order in the development of rheumatism in children, the articular affection coming subsequently. He dreaded "growing pains," and put a child on the use of cod-liver oil at once when they were complained of. As prophylactic measures he would advise the application of suitable oils to the skin and the wearing of flannel both summer and winter.

As regarded the therapeutics proper to a case of endocarditis, he had no faith in the power of salicylic acid, either in treatment or prevention; it was useful in articular disorders, not where the heart was involved. Antipyrin or phenacetin was preferable.

But, it might be asked, Why should the heart have this peculiar liability to develop severe lesions during an attack of rheumatism? When rheumatism invaded other parts and structures in the body it did not produce such injuries, or anything like as severe ones. If we found a joint in a state of redness, pain, and swelling such as rheumatism produced, we should say the prognosis was bad unless the attack proved to be rheumatic, for in that case the symptoms would pass away. If such a joint was examined just after death, it presented few indications, or perhaps none whatever, of the inflammatory process recently so active in it, whereas the heart did present permanent structural lesions. The explanation of this difference could be derived from a consideration of the unresting nature of the heart, and the necessarily intensified action of the rheumatic poison on the wall of a serous cavity subjected to such constant mechanical strain. If a man having rheumatism in his knee should kick a hundred and forty times in a minute, he would probably cause the development of structural changes which would remain for life; consequently, the importance of compelling the heart to beat slowly. In children the heart-beat was much more rapid than in adults; and, correspondingly, heart complications in rheumatism were more likely

to be developed. He therefore recommended full doses of aconite, and not of digitalis. Aconite allayed the irritability of the heart; also alkalies were to be given; and finally the utmost care exercised to protect the chest, so that the chilling of the sensitive cutaneous nerves should occur; especially should the chest area overlying the heart never be bared of covering.

Dr. J. Lewis Smith remarked that in thirty years of practice he had seen many cases of acute rheumatism in children. For fifteen years he had kept a record of the cases met with in the out-door department of Bellevue Hospital, in which rheumatism was developed in patients under 15 years of age. In seventy-eight of these cases there had been a cardiac bruit. As regarded age, he had not met with a single case where the patient was under 1 year old, and very few where the age was less than 2 years. In these very young patients there had been little swelling, but some tenderness in the joints. In most instances the disease in children commenced in the lower extremities—a matter of surprise to him—and tended, more or less, to travel upward. He agreed with previous speakers that in most instances the local manifestations were much less pronounced than in adults. There were many walking cases in children under 10 years of age.

As regarded "growing pains," often, after finding a cardiac bruit in a child, and questioning the mother if it had not suffered from rheumatism in the past, he had been answered that the father or the mother was subject to the disease, and that a few months previously the child had had "growing pains." It would be well to teach the laity that there was always a pathological condition behind "growing pains," and that by calling in a physician as soon as they were complained of, endocarditis and possible injury for life might be prevented. Sometimes œdema was the first pathological indication to attract attention, a swelling of the feet, shortness of breathing, and perhaps a hacking cough, being noticed before the other symptoms appeared. In one instance a child of 12 years had been brought to him suffering from lividity and coldness in the right hand and the left leg. He had soon been able to determine that the child had had a severe attack of rheumatism, and that evidently a deposit of fibrin had formed in the heart, emboli from which had lodged in the brachial and femoral arteries. The pains suffered from and the bruit were to be looked to for a diagnosis of endocarditis in children; the rheumatism which had caused it might have been latent. The heart would become enlarged after the disease had lasted more than a year. Quite often, in children, the pulse would be very rapid, showing the difficulty with which the heart was pumping the blood; for the same reason the enlargement took place.

He agreed with Dr. Jacobi that rheumatism was often the cause underlying the development of chorea minor. In one hundred and sixty-five cases of chorea minor of which he had kept a record, only eighteen had been due to rheumatism.

As to treatment, he had found the salicylate of sodium of great value if used early. He gave it internally, and also packed it around the affected joint.

Dr. H. D. Chapin remarked that while it was now recognized that rheumatism was a common disease in children, it was often difficult of diagnosis. There was no pathognomonic symptom, and we must depend on recognizing the composite picture of the disease. Wandering pains, endocarditis, hydræmia, and chorea were manifestations of one and the same condition. They might be met with together instead of following each other. If we paid attention to pain in a limb or joint without looking farther, it would be necessary to remember that not all pains were due to rheumatism. Bruises may have been received which gave no external signs; and, still more commonly, pain was due merely to muscular weariness, and especially soreness in the joints, following play. When rheumatism was present, it was even more apt to cause pain in the morning than in the evening, while pain due to the child's being tired would not, of course, be complained of in the morning. Heredity should always be given much weight.

Children having endocarditis were commonly allowed to get up too soon. He agreed with preceding speakers as to the importance of complete rest in the treatment of the affection. In fifteen or twenty out of sixty cases that he had met with, tonsillitis had appeared either before or after the rheumatic trouble. The causes of rheumatism seemed to be acidity in the stomach and bowels, derangement of the hepatic function, and a checking of the activity of the skin; in treating it, therefore, each of these factors should be kept in mind. Hot alkaline baths, a careful diet, and iron internally would often prevent the recurrence of the attack.

Dr. A. Seibert thought rheumatism in

children a disease due to infection quite as much as to heredity. He had seen it develop in young children whose parents had never suffered from it, but were attacked some time after their children. This had always occurred in families living in damp and dirty dwellings. Its infectious origin explained those cases in which endocarditis appeared before either a joint affection or chorea. He placed the disease in the same category with fibrous pneumonia, meningitis. and diphtheria; statistics had shown that it was most frequent in the same houses as the latter. He did not believe the mere chilling of the surface of the body could give rise to all the complications which attended rheumatism in children; and, moreover, young children were kept quite carefully in-doors in bad weather, and did not get exposed to cold and wet or chilling of the surface.

DR. J. C. PETERS replied to this that the houses of the poor were but too commonly damp and cold, and that children were very often the leading sufferers from this, owing to the carelessness of their mothers about their underclothes. In most of the cases he had met with it had been necessary to order better undergarments. In treatment he had found lithia (as distinguished from lithia water) of considerable value.

DR. A. CAILLÉ took much the same view as Dr. Seibert, believing the disease infectious, and hoping that in the new era of medical chemistry now appearing some substance would be found which would combat the poison of the disease.

THE TREATMENT OF FURUNCLES.

STAFF-SURGEON LEU, of the German army, sums up a long communication to the *Deutsche Militärärztliche Zeitschrift* on the treatment of furuncles with the following conclusions. Subcutaneous injection of carbolic acid is a simple and effectual abortive treatment of furuncles. Incipient furuncles which have not yet suppurated are especially adapted for this treatment. A cure results in these cases without necrosis of connective tissue; in the more advanced furuncles which have formed pus, or even discharging it, no deforming cicatrization follows. The proper strength of the carbolic acid is three per cent. This mode of treatment is particularly valuable in the army, because it shortens the time on the sick-list (when it is necessary to put the man on at all), and he returns to duty with a better cicatrix, while many may be treated without going to hospital. The simplicity of the apparatus required, consisting only of a Pravaz syringe and a small bottle of carbolic solution, makes it possible to apply the same anywhere and at all times,—for instance, during manœuvres and on the march.—*Lancet*, August 17, 1889.

THE ACTION OF BENZOYLECGONINE.

Dr. Stockman has set forth, in two valuable papers, which have been subjected to careful review by DR. LEECH (*Medical Chronicle*, August, 1889), the results of his investigations into the nature of the active constituents of the leaves of the erythroxylon coca, on which he has been for some time engaged.

Coca leaves contain, besides cocaine, an amorphous material, which forms from twenty-five to fifty-eight per cent. of the total alkaloidal matter, and concerning which there has been a difference of opinion. According to Stockman, this uncrystallizable substance has not always the same composition; sometimes it consists of cocaine mixed with a material called hygrin, and other bodies, which prevent it crystallizing; sometimes of a mixture of alkaloids, the chief of which is called cocamine, or isatropylcocaine.

Cocaine ($C_{17}H_{21}NO_4$), chemically considered, is methyl-benzoylecgonine,—that is, benzoylecgonine ($C_{16}H_{19}NO_4$), in which an atom of hydrogen has been replaced by methyl (CH_3).

Benzoylecgonine, again, is ecgonine ($C_9H_{15}NO_3$), in which an atom of hydrogen has been replaced by benzoyl (OCC_6H_5). Ecgonine itself is formed by the introduction of β-oxypropionic acid ($C_3H_6O_3$) into a molecule of methyl-tetra-hydropyridine ($C_5H_5N(CH_3)H_2$), each body losing an atom of hydrogen in the process, while methyl-tetra-hydropyridine is pyridine plus four atoms of hydrogen, one of which has been replaced by methyl. Cocamine, or isatropylcocaine, is constituted like cocaine, except that the radicle of isatropic acid is present instead of the radicle of benzoic acid. Cocaine, when treated with acid in a sealed tube, yields ecgonine, benzoic acid, and methyl alcohol; isatropylcocaine, under similar conditions, is split up into ecgonine, isatropic acid, and methyl-alcohol.

While ecgonine is formed when cocaine is heated with an acid, benzoylecgonine may be produced by heating it in a sealed tube with water. It is probably, indeed, present in badly-packed leaves, and is readily formed

during the process necessary for the extraction of cocaine from the leaf.

As both ecgonine and benzoylecgonine are produced by the decomposition of cocaine, and as cocamine is a constituent of the leaves of erythroxylon coca, these substances may at times be present in commercial cocaine, or even substituted for it; indeed, in giving a *résumé* of observations previously made on the physiological action of this alkaloid, Dr. Stockman points out that several of the observers seem to have been led to erroneous conclusions from unwittingly employing benzoylecgonine, or cocamine, instead of cocaine. Manifestly, then, it is desirable that we should know the physiological effects of ecgonine, benzoylecgonine, and cocamine, as well as of cocaine.

Cocaine, according to Dr. Stockman's experiments, in small doses ($\frac{1}{110}$ of a grain), depresses in the frog the activity of the brain and cord. He finds no antecedent stage of excitement. An appearance of paresis of the hind limbs is induced, and there may be slight inco-ordination, but both are due to depression of the sensory rather than the motor tracts, for the animal can jump vigorously, if there be a sufficient external stimulation.

Larger doses ($\frac{1}{80}$ to $\frac{1}{15}$ of a grain) still further depress the functions of the brain and cord, sensitiveness to external stimuli decreases, and the animal lies flaccid, but the reflex movements, when excited, are exaggerated; tetanus does not occur. The frog loses its power of localizing sensory impressions and of co-ordinating movements, but stimulation of a nerve stem, by pinching, is readily felt. Eventually sensory impressions almost cease to excite reflex action, but before this stage arrives, a peculiar condition is manifest,—a pinch occasions a violent reflex movement; with a second stimulation, the reflex is less strong, and, after a third or fourth, there is no response, yet, upon resting a short time, excitability returns. The gray cells of the cord seem to be so influenced that they discharge their energy violently, but exhaust themselves rapidly. The injection of $\frac{1}{7}$ to $\frac{1}{5}$ gr. causes complete sensory and motor paralysis; $\frac{1}{4}$ to $\frac{1}{3}$ of a grain cause death; convulsions are not induced.

With small doses, neither nerves nor muscles are apparently affected, but local application of cocaine distinctly affects the nerves.

Kochs (*Cent. f. Klin. Med.*, 1886, No. 46) found that the local application of cocaine to the sciatic nerve at first prevented evidence of sensation on irritation of the skin of the same leg; while stimulation of the nerve above the point of application of the cocaine causes a good muscular contraction; hence he concluded that cocaine at first paralyzes the sensory and not the motor fibres of the nerve. But Dr. Stockman quotes some experiments of Alms, which seem to show that the conduction of sensory and motor impressions is equally lessened. He thinks, however, that after the subcutaneous injection of cocaine the conduction of impressions is chiefly interfered with in the spinal cord. Only after large doses is there distinct depression of the conducting power of the peripheral nerves.

The conducting power of the nerves seems exhausted by strong stimuli, returning after an interval of rest. The muscles are practically not affected, being only rendered slightly less excitable at the point of contact with the cocaine solution. Application of cocaine to the cord causes similar symptoms to those produced by subcutaneous injection. Small doses dilate, large doses contract, the pupil in frogs.

The action of cocaine in mammals, Dr. Stockman thinks, is intermediate between that of morphine and caffeine. In rabbits, small amounts cause quietude; after medium or large doses there is excitement, which may, in part, be due to want of control in certain parts of the brain, due to paresis, caused by the cocaine in other parts. General sensibility becomes depressed, and indications of altered sensibility precede those of motor paresis. Cocaine has a very marked analgesic effect, as well as an anæsthetic effect, and Dr. Stockman thinks that deficient conduction of sensory impressions by the cord bears a greater share in the general loss of sensibility than the narcotic effect on the brain. In mammals, convulsions may occur.

Benzoylecgonine acts like caffeine, the muscular and central nervous system being chiefly affected, the peripheral nerves not at all. The $\frac{1}{20}$ to $\frac{1}{15}$ of a grain injected into a frog causes slight muscular stiffness, followed after some days by an increase in the reflex excitability of the cord. With a larger dose ($\frac{1}{10}$ of a grain), great stiffness, and even tetanus, may occur, lasting many days. Doses of $\frac{1}{2}$ to 1 grain are always fatal, and may cause death from rapid paralysis of heart and voluntary muscles without special symptoms. The muscles round the place of injection are found in a state of rigor mortis, those at a distance are but little affected, and the peripheral nerves are not influenced. Dr.

Stockman thinks the muscles absorb the poison when injected, but that afterwards little reaches the spinal cord, hence the late supervention of spinal symptoms. The direct application of benzoylecgonine to the cord causes tetanus.

Among mammals, rabbits are very insusceptible to the action of benzoylecgonine; 30 grains only caused diarrhœa. In cats, 15 grains produced excitement, dilated pupils, increased reflexes, and diarrhœa. A large dose induced tetanus. The heart's action was but little affected till just before death, which seemed to be due to failure of respiration.

After death the muscles do not respond to stimulation, but there is marked contraction of the intestines and bladder.

Ecgonine is less poisonous than either cocaine or benzoylecgonine. In cats and rabbits, very large doses have no apparent effects, and, in the frog, 7½ grains are not always lethal. Given by the mouth or subcutaneously to a frog, ¾ of a grain slightly increase the reflexes. Larger doses cause very slight lethargy and inco-ordination, by depressing the functions of the brain and cord; later on, increased spinal excitability is noticed, which may last some days.

The muscles round about the place of injection lose their electric irritability more or less, and pass into a condition of rigor mortis, and Dr. Stockman suggests that they probably absorb the poison. When the drug is taken by the mouth, the muscles throughout the body are equally affected, and spinal symptoms come on rapidly.

Tetanus is only produced when the drug is applied directly to the spinal cord. The heart stops in diastole, and is found dilated. Ecgonine has no marked action as a local anæsthetic, nor does it affect motor nerves unless injected into the blood-supply, when it depresses the conducting power of the nerves, and causes loss of muscular excitability. There is some little difference in its action on the rana temporaria and rana esculenta, the latter being least affected.

Cocamine resembles cocaine in many of its physiological effects, but small doses ($\frac{1}{70}$ to $\frac{1}{140}$ of a grain) produce general stimulation, causing the frog to be excited and restless, faintly increasing the reflexes, and making the muscles respond more sharply to nervous impulses.

Larger doses may give rise to nervous and muscular depression, and cause unwillingness to move, and muscular stiffness. Though the spinal reflexes are increased, the cord tends to rapid exhaustion, as in the case of cocaine.

Anæsthesia is produced at place of injection, and the function of the motor nerves is slightly depressed. The pupil is dilated. The increased reflex and the rigidity last after the other symptoms have passed away.

$\frac{1}{8}$ of a grain quickly paralyzes both muscular and nervous system without primary stimulations, acting more powerfully than cocaine, and affecting the motor nerves more profoundly. The pupils are rendered small. Subcutaneously given, this dose is always fatal.

Cocamine is an active muscle-poison, and the muscles round the point of injection quickly die. The neighboring muscles pass into a condition of rigor mortis, while the most distant ones are unaffected. The heart becomes slower and feeble, usually stopping in diastole.

The muscles tend to absorb the poison, but eventually it enters the circulation slowly, and produces increase of the spinal reflexes.

Small doses excite, but large doses depress the functions of the cord, and this latter effect is produced when it is applied to the cord itself.

Cocamine causes greater reflex excitability than cocaine, and in the later stages acts more powerfully as a paralyzant both on the nervous system, nerves, and on muscle,—a small amount is lethal.

In mammals, too, it produces powerful effects; $\frac{1}{8}$ to $\frac{3}{4}$ of a grain injected subcutaneously in rabbits dilates the pupil, and causes great restlessness and increase of the reflexes. This is followed by a tendency to quiescence. 1½ grains injected subcutaneously are always fatal, and may quickly kill by paralyzing the respiration.

Great muscular weakness is produced, but only slight indication of spinal excitement. The pupils are dilated, and the heart is feeble. 30 to 70 grains by the mouth cause great muscular depression but no spinal excitement.

In cats (in addition to the nervous symptoms) it causes vomiting and diarrhœa; and, immediately after death, both in cats and rabbits, peristalsis of the stomach and bowels is seen to be remarkedly energetic, both bladder and bowels being contracted. The motor nerves are never paralyzed.

Comparing the influence of the chief alkaloids of the coca plant and their derivatives, it appears that cocaine itself chiefly affects the nervous system, first as a transient depres-

sant, then as a stimulant, the action on the muscle being feeble.

Benzoylecgonine has first a stimulant action on the nervous system and muscle. Afterwards it paralyzes both. Ecgonine has a similar but much milder effect. Cocamine action resembles that of cocaine in many ways, but it exercises a profound influence on the muscle, while that of cocaine, though visible, is slight.

Hygrine, which is possibly a pyridine base, when injected under the skin of a frog, causes intense local irritation, and when applied to the tongue in man, burning and tingling.

Dr. Stockman, in conclusion, enters into some speculations as to the physiological cause of the phenomena said to arise from the use of coca leaf.

Its general sedative action is, he thinks, due to the dulling of the central nervous system to sensory stimuli. The secondary stimulant effect on the brain, and the loss of sensory conducting power in the cord explain the restfulness, apart from heaviness, said to accompany the feeling of well-being, which the coca-leaf produces.

Owing to the anæsthetic effects of its contained alkaloids, chewing the leaf dulls the feeling of hunger. Their action on the intestinal muscle prevents constipation, and, perhaps, they cause the skeletal muscles to contract better. The effect of coca alkaloids on metabolism is doubtful. It is possible, however, that cocamine, which, like caffeine, modifies the vital processes in the muscle, may effect chemical activity, so that an equal or greater amount of work can be performed with a lesser consumption of carbohydrates. This would explain its effects in increasing the endurance of fatigue by those who chew the leaf.

THE HÆMOSTATIC PROPERTIES OF ANTIPYRIN.

Almost ever since its introduction into therapeutics, antipyrin has been employed with success in the treatment of various hemorrhages, whether occurring in the form of epistaxis, metrorrhagia, purpura, or hemorrhage of traumatic origin; and a striking example of this property is published by Dr. Saint-Germain in the *Revue Mensuelle des Maladies de l'Enfance* for August, 1889. The case was one in which enormously hypertrophied tonsils were removed from a boy 14 years of age. The tonsils were removed by a bistoury and the bleeding surface vigorously mopped with a camel's-hair pencil soaked in a solution of antipyrin. Scarcely any hemorrhage whatever occurred, a fact which is attributed by the author to the hæmostatic properties of the antipyrin.

THE TREATMENT OF BURNS BY IODOFORM.

At the recent International Congress of Dermatology and Syphilography, held in August last in Paris, M. Schiff, as reported by a special correspondent of the *Medical Press and Circular* for August 28, 1889, spoke on the treatment of burns by iodoform, as advocated by M. von Mosetig-Moorhoff, which was very successful, especially in calming pain. The bullæ should first be cut away and the wounds gently washed with a very weak solution of table-salt, then several layers of iodoform gauze are placed on the burn, the whole covered with a layer of oilskin. The first dressing should not be changed before the end of the first, or even second, week. When the burn is situated on the face a pomade of iodoform of 1 in 20 should be applied, covered with oil-silk.

M. Hebra said that iodoform gave very good results in the treatment of burns *au début* before the eschars have become detached, but when that stage arrives iodoform prevents the granulations from being covered with epithelium. Resorcin, on the contrary, in a solution of one or two per cent., favors the rapid formation of epithelium.

THE TREATMENT OF PHARYNGEAL ANGINA BY THE INTERNAL ADMINISTRATION OF SALOL.

In 1888, Dr. Capart, in a clinical lecture, called attention to the almost miraculous power possessed by salol, given internally, in doses of 60 grains, in the treatment of suppurative tonsillitis; and this statement led Dr. Gouguenheim to test the value of this remedy in twenty-two different cases of various forms of inflammation of the soft palate, tonsils, and pharynx, employing doses of 45 to 60 grains, taken in three or four doses throughout the day. On account of its insolubility, the drug was simply suspended in a mucilaginous emulsion, which was subjected to thorough shaking before being administered. These cases appear to show that salol exerts the greatest influence on pharyngeal angina, whatever be its cause. The

author claims that it relieves with the greatest rapidity pain and dysphagia, while shortening the duration of suppurative tonsillitis, at the same time reducing temperature.—*Revue Générale de Clinique et de Thérapeutique*, August 22, 1889.

NAPHTHALIN AND TYPHOID.

According to the Berlin correspondent of the *Medical Press*, August 7, 1889, naphthol and naphthalin are now much employed as disinfectants of the intestinal canal, owing to a general belief in their germicidal power. Dr. Sehrwald has lately carried out a series of investigations with a view of determining precisely their efficiency in the laboratory of Professor Rossbach, of Jena, the results of which have lately appeared in an interesting form in the *Berlin. Kl. Wochenschrift.* His investigations were very extended and included a large nnmber of cultivation experiments, as well as experiments on animals. His results may be summarized as follows: Naphthalin acts only slightly on the micro-organisms of decomposition and of the fæces in typhoid, when the temperature is that of the room. Increased surface-action of the naphthalin, however, increases its power; when the temperature was raised to that of the body the action was much more intense, and it appears probable that the naphthalin first acts on the germs as a gas, damaging and destroying them. As a disinfectant in gaseous form it must act on fluids, more energetically in aërobes than on anaërobes. It must also attack such germs as are on firm soil more energetically than on those floating in liquids. The conditions in the intestinal canal favor the action of naphthalin, as the most favorable range of temperature is kept up, and the intestines by their peristaltic action favor the thorough intermixture of the germicide with the material to be disinfected. Naphthalin added to a fæcal mass reduces the germs to about one-half outside the body, but within to one-third or a quarter. The number, however, again increases in a short time, as some of the germs that have been more resistant than others recover their power of development. Added to typhoid stools naphthalin reduces the germ-contents to nearly one-tenth. Even the germs that remain after the administration of calomel are much damaged. As typhoid is to be considered a mixed infection, the administration of naphthalin should be begun from the first. The fact now ascertained, that part of its power is due to its action in the gaseous form, furnishes a new justification for its employment. As calomel acts as a germicide on some of the germs, it should be given; but as it spares others which in their turn are acted on by naphthalin this also should be given in order to make the treatment as rational as possible. Some of the naphthalin introduced into the body is absorbed and excreted through the kidneys. There is no reason to believe that this portion acts in any way as a germicide.

THE THERAPEUTIC LAW OF MM. DUJARDIN-BEAUMETZ AND BARDET.

The recent addition to our materia medica of a large number of synthetic chemical compounds has led to an attempt to formulate a law based upon the composition of those bodies, which can guide us in their selection for therapeutic purposes. With this object in view, MM. Dujardin-Beaumetz and Bardet have carefully studied a large number of the members of the aromatic series with the comparison of their action, with the object of formulating a law as to their therapeutic properties based upon their chemical constitution. According to these authors the aromatic compounds possess certain physiological properties which differ only in their degree of energy. They are at the same time antiseptic, antithermic, and analgesic, but, according to the chemical constitution, one or more of these properties always predominates and characterizes the therapeutic action of the body, and in some cases one property is so predominant as to render the others insensible. The law which these authors have formulated, and which was recently presented before the French Academy of Sciences, is as follows:

"Antiseptic effects especially characterize hydrated alcoholic derivatives, such as phenol, naphthol, etc.

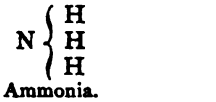
"Antithermic properties are predominant in the amidogen derivatives, such as acetanilid, kairin, thallin, etc.

"Finally, analgesic properties are especially marked in the amidogen compound, where one atom of hydrogen has been substituted by a fatty radical, and particularly methyl (such as antipyrin or exalgin)."

In criticising this law, Dr. M. J. Ville (*Gazette Hebdomadaire des Sciences Médicales*, July 27, 1889) claims that, from a chemical point of view, this law falls far short in the exactitude which should characterize the proposition that forms the basis of a scientific law. While, further, he claims that the au-

thors do not sufficiently take account of the principles of chemical nomenclature. Before considering in detail the objections which this author offers, it is necessary to define certain bodies which are concerned in the formulation of the law of Dujardin-Beaumetz and Bardet.

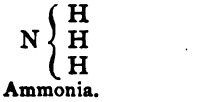
Amines.—This name is given to nitrogenous organic compounds which possess the characteristic properties of ammonia. Wurtz, who discovered this class, has shown that these bodies may be considered as ammonia, in which the hydrogen has been replaced entirely or in part by organic radicals, such as alcoholic radicals: for example,—



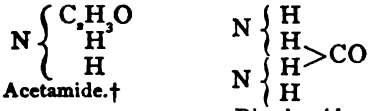
Ammonia.

Methylamine.* Phenylamine (aniline).

Amides.—These are nitrogenous organic compounds which closely agree with the amines in composition. They may be considered as derivatives of ammonia, in which the hydrogen is partially or totally displaced by acid radicals: for example,—



Ammonia.



Acetamide.† Dicarbamide (urea).‡

Alcalamides.—In constitution these bodies may be considered as derived from ammonia, in which the hydrogen is substituted partly by alcoholic radicals and partly by acid radicals: for example,—

Ammonia. Hippuric acid.§

* CH_3 is the methylic radical of methylic alcohol, CH_3OH.

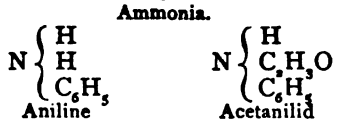
† C_2H_3O is the acid radical of acetic acid, $C_2H_3O.OH$.

‡ In urea CO may be considered as the acid radical of the hypothetical acid, carbonic acid, and takes the place of two hydrogen atoms in two molecules of ammonia.

§ C_7H_5O is the acid radical of benzoic acid, C_7H_5OOH. $CH_2CO.OH$ is the complex alcoholic radical corresponding to glycocholic acid,

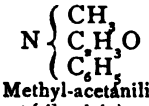
In this class of bodies are placed the anilides which are derivatives of aniline, in which an atom of hydrogen of the group NH_2 is replaced by the acid radical. As aniline is an amine, this substitution introduces an acid radical into its molecule, and it gives to the body a mixed amine-amide function; that is to say, an alcalamide: for example,—

Ammonia.



Aniline (*Phenylamine*). Acetanilid (*Antifebrin*).

The substitution of the hydrogen in the group NH_2 of aniline by organic radicals may be total, as is observed in the product recently introduced into medicine,—*exalgin*, or methylacetanilid:



Methyl-acetanilid (*Exalgin*).

Again, before discussing the last two propositions of the law of Drs. Beaumetz and Bardet, it is indispensable to define the bases of the pyridin and quinolin series.

Bases of the Quinolin and Pyridin Series.—Synthetic chemistry has led to the attaching of pyridin and quinolin to benzine and naphtholin; that is to say, they are derived by the substitution of an atom of nitrogen for a group C.H. of the aromatic radical.

Thus, if benzine should be expressed from the point of view of its chemical constitution by a regular hexagonal scheme of which the six sides are each occupied by a group CH, in pyridin one of the sides of the regular hexagon would be occupied by an atom of nitrogen. Thus,

Benzine. Pyridin.

This hypothesis, which is due to Dewar and Korner, rests on the synthesis of Ramsay, who was able to obtain pyridin artificially by passing a mixture of acetylene and hydrocyanic acid through a tube heated red hot. There exists between quinolin and naphtholin the same relationship as between pyridin and benzine, and Korner, attributing to quinolin a constitution analogous to that of pyridin, regards it as naphthalin, in which a group

CH is replaced by an atom of N. If one should represent schematically the formula of the constitution of naphtholin by a bihexagonal surface, produced by the association of two benzolin hexagons united by one of their sides, a figure will be formed which will have eight sides, each occupied by the group CH. In quinolin one of these sides is occupied by an atom of nitrogen. It may be mentioned that these theoretical views have been confirmed by the remarkable synthesis of quinolin by Friedländer.

We have thus acquired sufficient facts to be able to discuss the propositions formulated by MM. Dujardin-Beaumetz and Bardet, so as to determine if their propositions, from a chemical point of view, possess all the precision which should characterize a scientific law.

"Antiseptic effects," these authors say, "especially characterize hydrated alcoholic derivatives (phenol, naphthol, etc.)." Professor Ville takes exception to this statement, in that these substances are derivatives of phenol and not hydrated alcoholic derivatives; for phenol and naphthol, as well as other phenols,* although they resemble in some respects the alcohols, and especially the tertiary alcohols, nevertheless form a distinct class.

According to Professor Ville, the other propositions are still more open to discussion. "The antithermic properties," according to Dujardin-Beaumetz and Bardet, "are especially dominant in the derived amidogens (acetanilid, kairin, thallin, etc.)." Professor Ville here claims that the term "derived amidogen" is too vague and lacking in precision, and it is clearly evident that the authors group under this name bodies which show essential differences in their chemical composition.

Thus, acetanilid is an amine-amide, or an alcamide; kairin and thallin are quinolin derivatives. Applying, now, the definitions given above, it is easy to see the differences which these bodies present in their chemical constitutions. In acetanilid,

$$(C_6H_5)—N\begin{cases} H \\ C_2H_3O, \end{cases}$$

the nitrogen forms part of the lateral chain fixed on the aromatic radical. This lateral chain,

$$N\begin{cases} H \\ C_2H_3O, \end{cases}$$

comes from the substitution of the acid radical C_2H_3O for an atom of hydrogen of the amidogen group NH_2, which in anilin is the lateral chain, and is likewise fixed on the aromatic radical C_6H_5. In kairin and thallin, on the contrary, the nitrogen forms part of the aromatic root. These are, then, products at the same time of substitution and addition to quinolin, and should thus preserve the name of quinolin derivatives, and should not be confounded with the amines and the aromatic amides. The same objections may also be offered to the third proposition: "Analgesic properties attain a maximum in the amidogens where a fatty radical, and especially methyl, has been substituted for an atom of hydrogen (antipyrin, acetphenetidin, exalgin, etc.)." Antipyrin is a quinolin derivative, and should not be confounded with acetphenetidin and exalgin, which come from the substitution of organic radicals for the hydrogen in the lateral amidogen chain NH_2 fixed on the aromatic root. As regards exalgin, Professor Ville alludes to the confusion which has been introduced into the work of Dujardin-Beaumetz and Bardet, and which we have already referred to. These authors have confounded this body with aceto-orthotoluidin, for they designate this body as orthomethyl-acetanilid. We have already called attention to the fact that the correct name for exalgin is methyl-acetanilid. It would seem from the above that the propositions of Dujardin-Beaumetz and Bardet, not being based on strict chemical facts, possess little value as forming the basis for a scientific therapeutic law.

* Phenols are derived aromatic hydroxyls resulting from the substitution of hydroxyl, OH, for one or more atoms of hydrogen of the aromatic hydrocarbons.

THE LOCAL USE OF ICE OR COLD IN THE TREATMENT OF BURNS.

In the *American Practitioner and News* for August 17, 1889, DR. J. G. CARPENTER recommends in the treatment of burns the local use of ice or ice-water on account of the anodyne, anæsthetic, antiphlogistic, and astringent effects of the application.

He reports two cases of burns in which ½ grain of morphine and $\frac{1}{60}$ grain of atropine were given in one hour in divided doses to relieve pain and shock, and then soft linen cloths one-third larger than the area of the

burn were wrung out of the ice-water and applied to the burn. These cloths were changed every ten or fifteen minutes for twelve hours, then every hour or two for twenty-four hours, and then every two or three hours for twelve hours, and then dispensed with.

The writer claims that by the continuous use of cold in this manner, the pain, heat, redness, tumefaction, phlyctenula, and exfoliation of the cuticle were subdued and inflammation controlled; that in forty-eight hours the patient was virtually well of his burns.

In both the author's cases the patients suffered from no pain or discomfort as long as the applications were changed at proper intervals and used systematically. The question as to how cold acts is answered by the writer as follows:

The physiological action of ice or cold, first, is to cause vascular contraction through the vaso-motor nerves and diminish the amount of blood in the arterioles and capillaries; second, following this constriction of the vessels is a relaxation of the vaso-motor dilators and hyperæmia. When cold has been unduly applied, the vitality of the parts is impaired and the physiological congestion becomes pathological, and an inflammatory process is established. But in the treatment of burns the cold is judiciously applied just sufficiently to give ease and comfort to the patient. When there is pain, increase the cold or ice applications,—that is, make the cold more intense or change the applications oftener, at shorter intervals. As the inflammation subsides use less and less cold; though it must not be forgotten that cold, unduly applied, is an irritant, a pain-maker, and that ice applied directly to even pathological conditions is painful; but when the parts are protected by sufficient layers of cloths, in acute and subacute congestions and inflammations, it is an anodyne, anæsthetic, astringent, antiphlogistic, and local tonic.

Cold, locally, is similar to the action of cocaine, in that it contracts the arterioles and capillaries, drives the blood from the parts affected, blunts or obtunds sensibility, and is both anæsthetic and anodyne; and these effects can be continued indefinitely as long as the acute or subacute congestion or inflammation continues, and on subsidence of the latter the cold must be stopped. By this contraction of the blood-vessels by ice, in the treatment of burns, hyperæmia, and the other stages of inflammation are arrested or prevented, and ice is antiphlogistic. Through the anodyne, anæsthetic, and antiphlogistic effects of ice, local and general irritation is arrested and prevented, and excess of blood is drawn from the burn by the contraction of the blood-vessels. Ice is astringent, not only to the latter, but to all the tissues involved in the burn, and by holding the vessels in this contracted state becomes a local tonic.

Ice is not only indicated in the first and second stages of burns, but in all the stages contained in that most excellent classification of Dupuytren.

Authorities state the vesicles should be punctured in scalds or burns. This is, doubtless, bad practice, for the serum is lost and the blisters themselves become so many sores or wounds to be treated, as well as the other lesions of the burns. On the contrary, if ice or cold is used judiciously from the incipiency, or the first one or two hours after the burn, the serum is absorbed and a cohesion takes place by adhesive inflammation between the vesicle wall, cuticle, and *rete mucosum*, and the skin returns to its natural state. In burns, where there is exfoliation of the cuticle, the oases of erosion through the effects of cold do not suppurate. Ice can be used in conjunction with other measures that are aseptic and antiseptic in the other stages of burns, and the one supplements the other. In conclusion, it may be said that in the use of cold the lesions of burns are kept in an aseptic condition.

ANTIFEBRIN IN FEBRILE DISEASES.

Following the suggestion of Professor T. M. Bogomoloff, Dr. Vasily M. Edemsky, of St. Petersburg, has carried out (*Meditsinskoïe Obozreniïe*, No. 4, 1889, p. 415; and *St. Petersburg Inaugural Dissertation*, 1888, p. 129) a course of elaborate clinical experiments for the purpose of studying the therapeutic effects of antifebrin in various febrile affections. His materials consisted of twenty-five cases which came under his observation in the Krasnoselsky Udelnyi Hospital, and of which eight were referred to typhoid fever, six to pleuropneumonia and croupous pneumonia, three to acute or subacute rheumatic polyarthritis, two to chronic pneumonia, two to pleurisy, one to puerperal fever, one to intermittent, one to facial erysipelas, and one to gangrene of toes (*post-pernionesis*). The main outcome of the author's researches, as analyzed by Dr. V.

IDELSON in the *London Medical Recorder*, July 20, 1889, may be given in brief outline, as follows:

A. *The Influence of Antifebrin on the Temperature.*—1. Speaking generally, the rate of the antipyretic action is directly in proportion to the size of the dose used. 2. Given equal doses, the strongest effects are obtained in typhoid fever; then follow, in a descending scale, croupous pneumonia, pleurisy, chronic pneumonia, rheumatism, and, finally, puerperal fever. 3. The drug should be given in from 10- to 20-grain doses two or three times a day, or 5 grains every hour. The latter mode of administration is by far the better, since the fall of the temperature proceeds then more slowly and evenly, without being accompanied by profuse sweats, cyanosis, or collapse. Hence it is possible to administer quite safely and conveniently even as much as eighty grains of the drug a day. 4. For the first twenty or thirty minutes after a dose the temperature remains unaltered, but subsequently begins to sink about .1° C. every five or ten minutes. 5. A combined administration of antifebrin with antipyrin, from 3 to 5 grains of each, gives slighter antipyretic effects (including a later occurrence of a maximal fall) than that of antifebrin alone. [Professor T. J. Bogomoloff, of Gatchina, strongly recommends a combined administration of antifebrin in fractional doses (up to two or three drachms in twenty-four hours) every hour, with 5 grains of antipyrin, in puerperal and surgical fever, pulmonary phthisis, and acute rheumatism.—*Rep.*] 6. Antipyrin and thallin, in equal doses, and salicylate of soda, in double doses, are very inferior to antifebrin in respect to their antipyretic effects.

B. *The Influence on the Pulse and Respiration.*—1. The fall of the temperature is accompanied by a decrease in frequency of the pulse and respirations. 2. The decrease, however, is by no means always proportionate to the size of the dose. [Thus, in puerperal and typhoid fevers, smaller doses sometimes improve the pulse and respiration far more considerably than larger ones.] 3. Further, given equal doses of the drug, their effects vary according to the disease. [Thus, given 5-grain doses, the affections may be arranged in the following descending series in regard to the antipyretic effects: typhoid, croupous pneumonia, pleurisy, puerperal fever, chronic pneumonia. In the case of 10-grain doses: erysipelas, croupous pneumonia, chronic pneumonia, pleurisy, rheumatism, typhoid; 15-grain doses: croupous pneumonia, typhoid; 20-grain ones: pleurisy, croupous pneumonia, erysipelas, typhoid.] 4. A combined administration of antifebrin with antipyrin shows a less marked influence on the pulse and respiration than antifebrin alone. 5. Given all other equal conditions, antipyrin, thallin, and salicylate of soda likewise prove to be inferior to antifebrin. 6. The tension of the pulse (as measured by Basch's apparatus) is increased under the influence of antifebrin when the drug is given in moderate and even in more or less large doses.

C. *Nitrogenous Assimilation and Metabolism.*—1. Of four cases examined, in three the assimilation increased, in one decreased. 2. Of three cases examined, in two the metamorphosis increased, in one decreased. 3. The amount of extractive substances in the urine lessens, while that of the urea nitrogen rises in a corresponding degree.

D. *General Conclusions.*—1. Antifebrin may be especially recommended in typhoid fever as a good substitute for hydrotherapeutic methods, which are rather troublesome, and by no means invariably successful. While depressing the temperature, the drug subdues delirium and improves sleep and appetite. 2. The remedy is further indicated in pluerisy and acute rheumatism, where it promotes the absorption of effusions. [The same may be said, according to Dr. Bogomoloff, in regard to croupous pneumonia, *loc. cit.*—*Rep.*] 3. Antifebrin is one of the best remedies for erysipelas of the face or head, where it rapidly relieves headache. 4. In febrile affections generally, antifebrin should be preferred to antipyrin, quinine, thallin, or kairin, since "it depresses the temperature through its influence on the nervous system by increasing loss of the systemic heat, without causing any injury to the nerve-centres, heart, or kidney." 5. When employed in frequent small doses the drug gives rise to collapse but exceedingly rarely, and when it does the symptoms are dependent upon either some impurity of the preparation employed, or idiosyncrasy of the patient. In the *Medits. Obozrenii*, No. 5, 1887, p. 521, Dr. T. J. Rudenko, of Moscow, writes that he has tried antifebrin, in doses of from 2 to 4 grains, repeated in an hour or so (that is, from 4 to 8 grains a day), in eleven febrile cases (five of typhoid, one croupous pneumonia, two pleuropneumonia, one pleurisy, and two chronic pneumonia), and came to the following conclusions: 1. The drug is cheap, tasteless, and really antipyretic, free from any acces-

sory effects, except slight rigors and perspiration. 2. It does not show, however, any influence on the course of any of the diseases named. 3. Sometimes (in three pneumonic cases) it gives rise to a "black beer" discoloration of the urine, resembling that from kairin. 4. The fall of the temperature varies between .5° and 2.5° C., being mostly 1.2° or 1.8° C. 5. The amount of the decrease varies according to the patient's individual peculiarities and the height of fever, but, speaking generally, is larger when the drug is used in repeated small doses. 6. The decrease lasts from two to four hours, the temperature returning to its previous level in five or six hours. 7. The pulse slackens from eight to eighteen beats per minute. 8. In healthy persons (three cases), the same doses of the drug cause, in an hour, a rise of the temperature, amounting to .1° or .2° C., lasting two hours, and accompanied by a slight acceleration of the pulse.

In the *Meditz. Obozrenīē*, No. 1, 1888, p. 72, Dr. Ivan A. Albitzky, of Valkī, describes the case of his wife, suffering from advanced pulmonary phthisis, and treated after Kremīansky's method by the inhalation of aniline and the internal use of antifebrin. The latter was given in 10-grain doses, two or three times daily, day by day, for a twelvemonth. In all, the lady ingested about four pounds of the drug. No unpleasant effects from such prolonged use were ever noticed, the temperature being successfully kept by the means at 37.5° or 37.8° C. On the whole, the patient greatly improved, though she became blue (from aniline). At the Second General Meeting of Russian Medical Men at Moscow, Dr. Alexēi I. Shtcherbakoff, house-physician to Professor M. P. Tcherīnoff's clinic, made (*Transactions of the Meeting*, vol. i., 1887, p. 8) a communication on the treatment of pulmonary phthisis by inhalations of benzine fumes and antifebrin internally, in from 2- to 4-grain doses, in wafers. On the ground of eleven cases, the author states that antifebrin represents a very valuable antipyretic means in the therapeutics of consumption, though it does not exercise any appreciably direct influence on the disease itself. In a majority of cases, daily doses varying from 2 to 12 grains are said to secure a permanent apyrexia during the whole day and night, the decrease of the temperature not being accompanied by sweats, cyanosis, or rigors. In a certain proportion of cases, however, even larger doses (28 grains a day) fail to establish a stable defervescence. In such patients the drug may occasionally give rise to collapse, with a rapid fall of the temperature down to 34° C., and that even when the remedy is used in such small quantities as 4 grains. Now and then "antifebrin cannot be tolerated in consequence of its causing a kind of intoxication or a state resembling that arising from inhalation of coal-gas." As to the benzine inhalations (every hour for five minutes, 4 drachms daily), they are considered to invariably alleviate expectoration and cough, and never to be accompanied by any untoward effects beyond some headache or fulness about the head. In some patients they even seem to diminish the number of tubercle-bacilli in the sputa and to check altogether the progress of the pulmonary process.

At the same meeting, during a lively discussion following Dr. Ansēroff's communication, Dr. Jakov I. Trūsevitch, of St. Petersburg, said (*Meditz. Obozrenīē*, Nos. 2 and 3, 1887, p. 178) that he had seen grave collapse following an 8-grain dose of antifebrin in a typhoid girl of 12. Similarly, Dr. S. S. Golotūsheff, of Moscow, had observed collapse from a 5-grain dose in a woman. Curiously enough, a subsequent gradual increase of the dose (up to 8 grains) in the same patient was tolerated quite well. He came to the conclusion that the organism may get habituated to the remedy. Dr. A. G. Kramnik, of Smolensk, reported (*Vratch*, No. 4, 1887, p. 83) an instance of collapse from antifebrin in a patient with typhoid fever of an intermittent type. He believes that, in some cases at least, collapse may be caused by the antipyretic action of the drug coinciding with a spontaneous fall of the temperature (the result being a decrease far below the standard). Dr. V. I. Antūshevitch, a lady physician of Orlov, drew attention to the necessity of the utmost caution in the use of powerful antipyretic drugs in general, since they may give rise to some other very unpleasant complications in addition to collapse. Thus, in a strong woman suffering from typhoid fever, "one gramme of antipyrin had been followed by a striking dilatation of the peripheral blood-vessels, with stasis and consecutive gangrene of a foot." Such cases were thought to be "caused by a depressing action of antipyretics on the heart." In his remarkable work "On Infection and Phthisis" (Kharkov, 1887), Professor Jakov S. Kremīansky warmly eulogizes the internal use of antifebrin in consumption, not only as an antipyretic, but also as a bactericide. The author frequently observed a distinct diminution of tubercle-

bacilli in the sputa, effected by the drug. As a rule, he gives from 3 to 5 grains, three or four times daily, but in such cases, where the doses fail to secure a permanent defervescence, he increases the amount sometimes to sixty, or even seventy, grains a day. He never yet met with a single instance of collapse or any other untoward effects from the drug.

Reviews.

NATURE'S HYGIENE. A SYSTEMATIC MANUAL OF NATURAL HYGIENE, CONTAINING A DETAILED ACCOUNT OF THE CHEMISTRY AND HYGIENE OF EUCALYPTUS, PINE, AND CAMPHOR FORESTS AND INDUSTRIES CONNECTED THEREWITH. By C. T. Kingzett, F.I.C., F.C.S, etc. Third edition.

London: Baillière, Tindall & Cox, Kingwilliam Street, Strand, 1888.

"Nature's Hygiene" reminds us of "Nature's Own Cures," which we read about in the newspapers, and they are only other names for man's fraud and failure. It is to be hoped that "Nature's Hygiene" is not in like manner somewhat tainted. And yet throughout the book this idea clings like an odor of decay to facts apparently the freshest and observations the newest. It is very readable, and to the scientific student, after turning over his desiccated manual, it may seem a veritable specimen of light literature, quite a fiction of science, but it is, like many novels of to-day, written with a deep purpose,—viz., to vaunt the virtues of "sanitas" in every conceivable way. It is very thorough and systematic, beginning with the alphabet of science,—the "constitution of matter." It abounds in statistics and tabulated statements. It covers all sanitary subjects,—ventilation, sewerage, water-supply, etc., but for "sanitas" it has ever its word to say, and "sanitas" throws a suspicious gloom over the author's facts, and makes us for a moment doubt his soundest conclusions. Is sewer-gas proved to need a purifier, "sanitas" does it first, last, and best. Are rooms stuffy from foul air, "sanitas" can rectify that. Is water poisoned at its source, so much "sanitas" to the gallon, and lo! it is pure. No "certain herb" made the waters of Marah sweet for the thirsty Israelites with half the speed and certainty with which "sanitas" would have done it. When the author enters upon a comparative study of antiseptics and germicides, lo! "sanitas," like the name of Abou Ben Adem, "leads all the rest." When he goes farther, and investigates disease, tries to educe from scientific reasoning some way of successfully struggling with bacilli, bacteria, and ptomaïnes, what but "sanitas" leaps boldly to the attack where older combatants hesitate and give way? When tubercle is proved to depend upon a bacillus, "we must resort for a cure to a disinfectant which will arrest the development of the micro-organism without harming the host." "Such an agent is 'sanitas' oil;" and so on through the list of diseases which afflict humanity.

The latter half of the book is devoted entirely to "sanitas" and its alleged ingredients. The study of the eucalyptus is here found prescribed in the most thorough and favorable way. Then pine, whose oil also enters, we are told, into "sanitas," has its virtues extolled till we almost doubt them, and peroxide of hydrogen, turpentine, and camphor close the volume. Taken as a whole, elaborate, scientific work, written by a man of acknowledged scientific attainments, and yet in reality only as a gigantic puff of a proprietary remedy, the book is a monumental anomaly in the field of scientific advancement.

E. W. W.

THE PHYSICIAN HIMSELF, AND THINGS THAT CONCERN HIS REPUTATION AND SUCCESS. By D. W. Cattell, M D., Baltimore, Md. Ninth edition, revised and enlarged.

Philadelphia and London: F. A. Davis, 1889.

Since noticing this work it has gone through five more editions, making nine in all, and has been revised and enlarged. It has grown in grace as well as in size, both in grace of form, its binding and general appearance being much more refined, and in what might be considered as "inward and spiritual grace," to borrow from the theologians, and at almost every turn of the page there can be descried an elevation of moral tone which was needed. It is not always so worldly-wise. It allows a man now, even if desirous of professional success, to do some few things nobly, to take some active part in life, have some sentiment of his own unsmothered by his craze for pelf. The poor, idealess, washed-out creature, who was bound to succeed in edition the fourth, now stands a little more erect, has a few opinions which he dare express, especially if they are on the side of the majority,—the rich and influential majority of his own community. He has made something, put away something in bond and mortgage, in real estate and sound stocks, by following his guide through the earlier edi-

tions, and now he ventures a little independence; but, alas! a hundred editions will be needed at his present rate of progress to make him a decent man, with backbone and moral virility. "The Physician Himself" contains, we acknowledge, a vast amount of worldly wisdom, and one may follow its guidance with advantage in many cross-roads of life without loss of self-respect; but there must be a line drawn somewhere, and one can hardly obliterate all the salient points of his character for a little more money, a few more dollars and cents, without deterioration. And when, if ever, the release comes, when by long following of his "vade-mecum" he is independent at last, will it not be hard even to shake off the life-long monitor? Will he not be so trained in cringing that he cannot stand upright? And, as for the actual value of the book to its possessors, now that so many have bought it, read it, and approved it, has not every one noticed how of late the old-time friction between one physician and another has diminished? Can we not parody, and say, "See how these physicians love one another?" And are we not all as a body, and individually, growing richer, living better, just from the influence of one small book,—"The Physician Himself?" If in every department such books could only be written; if we could have for the shoemaker "The Shoemaker Himself," and for the burglar "The Burglar Himself," and even "The Murderer Himself," as well as similar books for scavengers and railroad presidents and loafers and cranks and politicians, how speedily, if the books acted in other employments as the one before us has done, would the millennium come,—that fast-fading vision of time, when the lion and the lamb, homœopath and allopath, laborer and capitalist, shall lie down together! but, alas! they will lie down not so very far apart from their long rest, and none shall hurt or destroy, for the arms of all shall be nerveless, and death will triumph over the physician himself, with his animosities and struggles. Whether he will look back in his last hours with great satisfaction upon a busy and useful life, spent in following our author's precepts, or, perhaps, with greater if he has carved out his own character and developed himself rather upon the lines nature gave him and with the guidance religion and morality afford, will depend somewhat upon whether he buys and reads and follows "The Physician Himself."

E. W. W.

Correspondence.

PARIS.

(From our Special Correspondent.)

Aniseed Oil the Injurious Agent in Absinthe—Bismuth as a Substitute for Mercury—Exposition Nosology—Guaco in Eczema—Theine Sold for Caffeine—Turkish Way of giving Backshish.

A recent letter related interesting physiological experiments made by Drs. Cadéac and Albin Meunier, of Lyons, with anise- and fennel-seed-oils.* The investigations, it now appears, were only a part of a rough research undertaken on the injurious constituent of baneful "absinthe." The notorious bitter, as most people probably know, was first introduced in Algeria as an appetizer and fever preventive, and it there proved beneficial, wormwood—in French, *absinthe*—being really a good febrifuge and tonic. Only various aromatics were successively added to improve the flavor, and it soon became a regular tipple. Some elixirs, too well known in American drug-stores to need mentioning by name, have had similar fortunes, nearly all the medicine being on the label for show. Sensational statements have been circulating about the consumption of absinthe. The truth is, many here never touch it, some because they dislike the flavor, and others because their claret and water is all that they care for, while the majority use absinthe in moderation,—that is, one glass as an appetizer before meals. Yet, it must be confessed, there are slaves to absinthe as there are to opium or coca, and the baneful effects of the abuse on some classes cannot be denied. They are, indeed, well known, and have often been described in medical treatises. Only wormwood, giving the name to the compound liquor, has naturally been considered responsible for the accidents, and "absinthism" is the term applied to the general symptoms. Of late, however, the doctrine has been called in question. First, the quality of the alcohol was in cheaper absinthes shown to be very bad, the highly aromatic taste enabling the maker to use unpurified spirit contaminated with the poisonous fusel oil, furfurol, and higher alcohols generally. Now Drs. Cadéac and Meunier have again taken up the investigation in a more systematic manner, and examined separately each one of the ingredients. The usual formula for absinthe, it seems, is as follows:

* THE THERAPEUTIC GAZETTE for August, 1889, page 568.

Essential oil of anise, 6 grammes;
Essential oil of star anise, 4 grammes;
Essential oil of wormwood, 2 grammes;
Essential oil of coriander, 2 grammes;
Essential oil of fennel, 2 grammes;
Essential oil of peppermint, 1 gramme;
Essential oil of hyssop, 1 gramme;
Essential oil of angelica, 1 gramme;
Essential oil of lemon balm, 1 gramme;
Alcohol of 70°, 1 litre.

Dissolve, and color green with either fresh parsley or nettle-leaves.

Hence, when our Gallic friend proceeds to what he calls *étouffer un perroquet* (to choke a parrot), he absorbs, not to speak of the alcohol good or bad, various oils, of which wormwood forms only ten per cent. According to the memoir last week presented to the Paris Academy of Medicine by the Lyonese doctors, the following are the effects on a healthy man of the different oils composing absinthe: 1. Oil of hyssop, in ½-grain dose, on an empty stomach, will cause general stimulation, followed successively by visual aberrations, torpor, tremors, vertigo, and somnolency; it is a powerful epileptizer. Yet, as its proportion in the liquor is small, its share in the injurious action of absinthe is inconsiderable. 2. Coriander: 16 grains on an empty stomach will make one feel comfortable, and for twelve hours procure pleasant general stimulation, accompanied by no tremors or somnolency. Toxic doses will determine sudden anæsthesia, but never any convulsive symptoms. Considering the small proportion in the liquor, it only acts there as an exhilarant and stimulant. 3. Fennel: 16 grains, to a man fasting, will cause visual troubles and head heaviness, soon followed by pleasurable stimulation and imperious need of motion, accompanied with the enjoyment of moving for its own sake. After an hour, tremors follow, together with prostration and somnolence. In the proportion of two grammes per litre oil of fennel imparts to absinthe only stimulating properties, but when partly substituted to anise it will render it convulsivant. 4. Wormwood: 2 grammes (30 grains) of the oil, when taken on an empty stomach, for several mornings in succession, will induce in man a feeling of comfort, self-confidence, and muscular power, with clear perceptions and pleasant thoughts. No vertigo, tinglings or tremors are observed, and only increased appetite and improved digestion. Afterwards no depression or somnolence will be noticed. Hence the opinion that wormwood (absinthe) is the cause of absinthism is wrong, since for several days a man may without harm absorb as much of it as is contained in a whole litre of absinthe. 5. Lemon balm: 30 grains will cause, after a short stimulation, weariness and sleepiness. To a slight extent it plays a part in the heaviness, prostration, and somnolence of absinthe-drinkers. 6. Peppermint: 30 grains on an empty stomach will occasion general warmth, followed by perspiration. In large doses it acts much like ordinary alcohol; otherwise it operates chiefly on the stomach and intestines, which for two hours it causes to contract powerfully. 7. Angelica: in 30-grain doses, internal warmth and stimulation, followed by general depression. 8. Anise and star anise: both have identical properties; 15 grains of the oil on an empty stomach will procure at first a feeling of general warmth and want of motion, followed in ten minutes by sudden depression. The sight will become confused, the gait faltering and inco-ordinate, motion slothful, and will impaired. Soon tremors and stupor will ensue, while the feeling of comfort persists, and sleep will supervene for about two hours. The dull inebriety will last to the following day, but neither the appetite nor the digestion be impaired. Although anise oil cannot be said to be a poison, it is very injurious to the nervous centres, as but little more than 15 grains will occasion epileptiform attacks, and to it chiefly and fennel should the injurious effects of absinthe be attributed. The bitter being taken diluted with about eight times as much water, Drs. Cadéac and Meunier think the influence of alcohol may be neglected. Should their conclusion be adopted, the mischief occasioned by the green-eyed fairy (*la fée aux yeux verts*)—and according to the tale there were wicked as well as good fairies—should be called absinthism no longer, but anisism.

Experiments with bismuth hypodermically have been begun, as you were advised beforehand, but so far the results cannot be considered altogether satisfactory. Preliminary trials on animals were made at the Sorbonne laboratory by Dr. F. Balzer, of the Lourcine Hospital. The solution used was the ammonio-citrate, prepared by pharmacist Portes of the same hospital, in accordance with the American national formulary of unofficinal preparations, and diluted so as to contain two centigrammes (⅓ gr.) of metallic bismuth to the cubic centimetre (16 gtt.) The effects were gingival ulcerations and other buccal lesions; abundant salivation, and stomatitis more sudden and severe than when caused

by mercury. With small doses, long repeated, the gums presented a brownish-purple line at the edge, teeth became loosened, and breath fetid. In one case a ten-pound dog died two days after one hypodermic injection representing fourteen centigrammes (2 grs.) of metallic bismuth. In another, a twenty-two-pound dog, after being administered sixteen centigrammes (2½ grs.) inside of ten days, and ten centigrammes (1½ grs.) more afterwards, all in small daily doses, died on the eighteenth day. Next, a fifteen-pound dog survived after a number of daily injections of one centigramme (⅙ gr.), while another died under doubtful circumstances. Chemical analysis showed large quantities of bismuth in the urine and saliva during life, and, after death, in most tissues, but chiefly in the liver and kidneys. The idea was to try bismuth as a substitute for mercury in syphilitic diseases, but the experiments, though as yet incomplete, hardly encourage a change of the sort. It will probably be news to most American practitioners to hear that even a dog can be poisoned with citrate of bismuth.

A curious article on Exposition patients might be written by the physicians attached to the medical bureau. But so far, only statistics have been published, with now and then suggestive remarks, serving only to whet curiosity. A medical service was, of course, organized from the beginning, thousands of workmen being employed on the lofty structures, and exposed to the ordinary risks of building trades. When the Exposition opened to the public, provisions were made for the expected attendance, and medical stations established in four different places, connected by telephone. Although one hundred thousand visitors a day only were counted upon, and the number was often doubled, and occasionally trebled, the service has been equal to all demands. On an average, so far, five or six hundred patients have been attended every month. Strange enough to say, leaving aside casualties not chargeable to the Exposition, the great majority were cases of syncope, caused by fatigue, heat, and want of food. Not that the patients were penniless; but, after long and uncomfortable railroad journeys, sleepless and tired, they had rushed to the Exposition, and there wandered from section to section, in their admiration for the wonders forgetting all their bodily wants, till they fell fainting from sheer exhaustion. The opposite excess brought others to grief. Coming in with a large family and a well-applied basket, they had spread themselves under a shading tree,—there is nothing a Frenchman loves like eating in open air,—and partaken too heartily of the good things provided by the thoughtful housewife. After a long tramp the tired stomach will sometimes crave more food than it can well manage. Drunkenness proper has been rare. Paris air seems not to favor hard drinking. But cases of what may be termed nervous inebriety have not been unfrequent, especially among women. On a hot day, fatigued and desperately thirsty, they would swallow at one draught a large tumbler of iced lemonade, with something in it added by a well-meaning male escort to keep the chill out, and suddenly they would see everything, the Eiffel tower included, turn around them, and have to be taken to the medical station. There the attendant smiles, and with a few drops of ether soon sets them on their feet again. Sunstrokes, notwithstanding the unprecedented warm summer, have been very rare, owing probably to the trees and the liberal provision of awnings covering all the important walks in the open grounds. But perhaps the most characteristic affection is the nervous shock occasioned by the tower gun. Every night, at a quarter to ten, after the luminous fountains have been playing for some time, and entranced the beholders by their gorgeous display of changing colors, a gun is fired from the Eiffel tower, as a signal that it is going to be set ablaze for the final tableau. At the unexpected report, quite a number of young girls will go into hysterics, and have to be carried away fainting, or half-crazy, to the medical station, where they are soon revived. Dr. Charcot, it is said, is taking notes on these cases, as pertaining to his specialty of nervous affections and hypnotism.

After every important event, like the recent Therapeutic Congress, some interesting items usually remain to be gleaned when the harvest has been gathered in. Among such, a paper on guaco may be mentioned, which was presented by Dr. L. Butte, of the Saint-Louis Hospital, and only read by title. The preparation experimented with was a watery extract from the root of *Aristolochia cymbifera*, the true guaco, according to Guibourt. From researches on animals, Dr. Butte has concluded that the extract chiefly acts on the digestive and also the nervous system. It is an emeto-cathartic, too powerful and dangerous, however, to be at present recommended in human therapeutics. On the other hand, the analgesic properties of guaco suggested

its trial in local applications for the pruritus of some skin-affections, and as such it proved very beneficial in cases of dry eczema with intolerable itching, with burning sensation, making sleep impossible. The drug, in the shape of a decoction,—about five drachms of the coarse powder to a quart,—was applied in lukewarm fomentations and compresses, and every time greatly relieved the patients, allowing them to enjoy refreshing sleep, a comfort no other treatment had before afforded. At the same time the eczematous lesions appeared to gradually change for the better. Yet it is important to bear in mind that in cases of discharging or eruptive eczema, the lotions should be withheld, as guaco is apt to cause irritation.

Another instructive piece of information brought out during the discussion respecting the properties of caffeine, is that most of the active principle now found in the market is not extracted from coffee, but theine obtained from refuse teas injured during the sea-voyage. Although the two substances have hitherto been by most chemists considered identical, there are now good reasons to think they are not, but only isomerous, which is quite another affair. Certain it is that tea will cause palpitations of the heart, while coffee will not, and that the same symptom, unknown when true caffeine was used, has greatly puzzled recent experimenters with the product now supplied under the same name. And, lastly, an amusing incident occurred at Rheims, where the Common Council gave a reception with a lunch to a visiting delegation of congressmen. Colonel Bonkowski-Bey, the Turkish representative at the Congress of Therapeutics, was, owing to his fez, mistaken for the Shah of Persia, then also a guest of France. The Rhemish gamins began shouting "Vive le Chah!" The good Bey, to get rid of them, said, pointing to Dr. Bertillon, the anthropometric scientist, they should apply to the next man, his purse-bearer. Dr. Bertillon took the joke, and with a few pennies satisfied the urchins, admitting he was caught fairly.

PARIS, September 20, 1889.

LONDON.

(From our Special Correspondent.)

Ever since the introduction of antipyrin into practical medicine communications have been continually made to the medical journals of various countries on its physiological and therapeutical action. In spite, however, of the great amount of research done, the action of the drug is not yet fully explained. This, perhaps, is partly due to the fact that antipyrin acts on those functions of the body about which there is still diverse opinion among physiologists. These functions are those connected with the regulation of heat-production and heat-loss in the body, and those of sensation. One of the latest contributions to the subject is by Dr. Batten and Mr. Bokersham, who have conducted their experiments under the direction of Dr. Lauder Brunton at St. Bartholomew's Hospital. The object of the research was to elucidate, if possible, the action of antipyrin in cases of migraine, and in those forms of headache to which the specific name of migraine cannot be applied. In some of these cases, as the authors explain, the temporal arteries have been observed to be in a condition of spasm, which may be considered as in causative relation to the pain. In testing, however, the effect of antipyrin on the walls of the blood-vessels, it was found that the drug had no effect in causing them to expand or to contract, a fact which may be taken as in accordance with the generally received opinion that antipyrin has no effect on the normal blood-pressure. It must, however, be allowed that the drug may have an effect on a pathologically contracted arteriole, acting on the nerves supplying the vessel wall, or on the centres in connection with them. In another respect the experiments of these observers are interesting. It was found that in cats and guinea-pigs antipyrin produced spastic rigidity of the hind limbs, lasting a few hours. This rigidity resembles in many points the similar condition observed in lateral sclerosis in men. Thus it was induced and aggravated with any attempt to use the limbs, and there was a great excess of myolatic irritability, and in one experiment "phenomena similar to that of ankle-clonus were obtained." Antipyrin in these animals, therefore, appears to act on the lateral columns of the spinal cord. Whatever may be the results obtained by subsequent observers on this point, there is no doubt that the exact localization of the action of drugs on a particular portion or tract of the central nervous system is a subject of extreme importance. It is, indeed, only by this exact knowledge that we can hope to affect by means of medicaments the pathological changes that occur in the central nervous system,—changes which are now combated with but little success by the despairing physician.

This year the Croonian Lecture before the Royal Society was delivered by M. Roux, in the place of M. Pasteur, who had been invited to deliver it, but was unable to be present. M. Roux, who is well known as a disciple of Pasteur, spoke on "Preventive Inoculation." In a very interesting lecture, he dealt with the history of the subject, bringing out the salient facts established by Pasteur's brilliant investigations. The lecture comes very *apropos* of the proposal to subscribe towards the Pasteur Institute of Paris, on account of the number of English patients treated there. This proposal has been, as was expected, strenuously opposed by a certain section of the community; but, at a very successful meeting, held under the presidency of the lord mayor at the Mansion House, a large sum of money was subscribed to the institute. No doubt in time the authorities in England will see their way to enforcing measures which will materially aid in stamping out hydrophobia.

In a communication made last year before the Therapeutical Section, at the meeting of the British Medical Association in Glasgow, Professor Thomas Fraser gave the results of his investigations into the relative usefulness of iodine and morphine in the treatment of diabetes mellitus. Great stimulus was no doubt given to the employment of codeine in this disease by the beneficial effects ascribed by Pavy to it on its first introduction. It was said to act better than morphine or opium. As Fraser remarks, it would be difficult *à priori* to assign any reason for this superiority of action of codeine over morphine, and, as he points out, in all its other effects, it acts only as a "weak morphine," a somewhat happy phrase, which exactly expresses the effect of the drug. This is well seen in the relief of cough, in the production of sleep, or the removal of pain in the abdomen or elsewhere." Is this the same in diabetes? For several years Fraser has been investigating the question, and the results are clear from his carefully rendered cases. Morphine was found in all cases to have a more powerful effect than codeine; it caused a greater diminution both of the water and of the sugar contained in the urine. Dr. Mitchell Bruce had previously arrived at the same conclusion, and quite independently, so that it must be taken as proved that codeine is not so advantageous in the treatment of diabetes as morphine. One fact which Bruce states seems of great importance,—viz., that morphine has a more powerful effect when given by the mouth than when given by hypodermic injection. Further investigation of this point is necessary, but it may be shown in the future that morphine when taken directly to the liver, as it would be by the portal blood when given by the mouth, may influence the transformation of glycogen into sugar.

Dr. Lauder Brunton has lately been delivering the Croonian Lectures before the Royal College of Physicians. As was to be expected, Dr. Brunton chose as his subject scientific therapeutics, the title of his lectures being the "Relationship between Chemical Structure and Physiological Action." The ground covered was naturally very extensive, but the subject was treated chiefly in relation to the varying action of the organic (carbon) compounds. Many of the facts stated by the lecturer were already well known, but many also were new: and the chief importance of the lectures lies in the consideration that it is a serious attempt to group together the principles of modern therapeutics, to indicate the usefulness of pharmacology in guiding the physician in the selection of his remedies, and the importance of the study of chemical pathology in the treatment of disease by drugs. In my next letter I hope to give some account of the new facts brought out by Dr. Brunton in these lectures.

HYSTERO-EPILEPSY IN THE MALE.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In compliance with the request of Dr. Cheves Bevill, of Winfield, Ark., I send you for publication the following report of a case of hystero-epilepsy in the male, which came under my observation in September, 1886, the symptoms of which, in the main, resemble those of the case reported by him in the GAZETTE of August 15.

J. S., aged 23, a German, somewhat pale and nervous, and although presenting no symptoms of any appreciable disease, was not as strong and vigorous as might be expected.

On September 14 I was hurriedly called to see him. His friends informed me that he was suddenly taken with a chill and vomiting. I found him exceedingly restless, violently tossing about on the bed; pulse 100; respiration extremely rapid and shallow; face livid and temperature normal. There was present considerable muscular rigidity. He groaned as if in great pain. I gave him a

hypodermic injection of morphine, gr. ¼. In about half an hour he became quiet; respiration and pulse normal. Immediately he seemed to fall into a deep sleep, which lasted about two hours, when he awoke with a wild and vacant stare. He did not have any recollection of what had transpired, but complained of a feeling of oppression in the epigastrium. After an interval of half an hour he again became violently restless, and a repetition of the symptoms already described took place.

This state of affairs continued for five days, the paroxysms, however, becoming less violent and frequent each day.

After the administration of a cathartic, I gave him large doses of bromide of potassium and chloral hydrate, which seemed to have a beneficial effect.

After the cessation of the paroxysms he was completely prostrated, and required nearly two weeks to regain his usual strength.

Since then he has had two or three similar attacks, less violent, and of shorter duration.

The old and erroneous idea that hysteria is dependent entirely on uterine irritation, and consequently necessarily a disease of women only, has been exploded some time ago. It is only peculiar to the female in a greater existing *predisposition*.

Yours truly,

N. McCABE, M.D.

NORTH PLATTE, NEB., September 24, 1889.

THE TREATMENT OF SEWAGE IN LONDON.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—This morning at 10 A.M. Mr. W. I. Dibdin, chemist to the London County Council, met me at the Charing Cross Pier with his steam launch. For many miles below London Bridge we steamed through a much clearer water than that of the Schuylkill at Philadelphia below Fairmount dam, which stream is fast becoming a cesspool. A few minutes before we arrived at Crossness (fourteen miles below London Bridge), the smell of sewage was quite perceptible. At this point the intercepting sewer, for all the Surrey side of London pours its contents, mixed with the rainfall, into the Thames, yet it is robbed of its solid matter, which is precipitated by the mixing of lime and sulphate of iron (four grains of lime, one grain of sulphate of iron to the gallon), and the effluent, as it pours into the Thames, is treated with permanganate of potassium. This is not added in sufficient quantity, owing to the fact that two hundred thousand pounds a year—the sum allowed for the sewage-works of London—is not sufficient to properly treat one hundred and sixty millions of gallons a day. I think you will agree with me when I say this process is the best chemical one in use. One great advantage over the chlorinated lime process is that the micro-organisms are not destroyed, consequently the endless cycle of physical change is not interfered with. The sludge is pumped into vessels, from which it is distributed on the high seas.

The process that you will be particularly interested in, and for which I paid my visit to Crossness, is that accomplished by means of electrolysis. It would seem that this process was first applied by W. W. Webster, F.C.S., who claims for it that it is the most effective and the cheapest manner for separating organic matter and at the same time of disinfecting. It does appear to be a most satisfactory solution of the question of the separation of organic matter in sewage and the rendering the effluent innocuous. The following result is claimed:

	Sewage. Present.	Effluent. None.
Sulphuretted hydrogen		
Nitrogen as (free) ammonia	1.89	0.83
Nitrogen as organic matter	0.54	0.24
Oxygen required to oxidize organic matter	9.57	1.21
Total suspended matter	15.43	2.28
Total suspended matter, of which mineral	7.43	1.99
Total suspended matter, of which organic	8.00	0.29

The process of obtaining this result at the Crossness Works is about as follows, and is so described by Mr. Webster:

First, starting with the engine-shed. The engine is about twenty-five horse-power, nominal. This pumps the sewage and drives the dynamo. The latter is an Edison-Hopkinson, capable of developing an energy of forty-three horse-power. From the dynamo the loads run through resistance-frames, by means of which the amount of current can be regulated without varying the speed of the engine. These are then connected with the iron electrodes in both the precipitating-tanks and the shoot. The precipitating-tanks are used for taking experimental measurements, so as to discover the best mode of arranging the electrodes or plates made of wrought iron; cast iron would certainly answer the purpose. The shoots are of wood. The sewage is pumped from the sewer into the elevated end of the first shoot. While flowing through the shoot, it comes in contact with the electrodes or plates, which are

arranged parallel to each other, and run longitudinally through the shoot, about two inches apart. It is then directed to the settling-tank, when it separates into sludge and effluent. It is claimed that the current density employed in the shoot is about one ampère per eleven square feet of surface, the total current being about five hundred ampères. The sewage occupies about ten minutes in travelling the full length of the shoot, which is about four hundred feet in length. The total quantity of electricity employed is at the rate of twenty-five ampère-tones per gallon of sewage.

The chemical treatment of sewage in different towns would appear to cost from thirty shillings to seventy shillings per one million gallons, whereas it is calculated that by means of electrolysis it will only cost about twenty shillings per million. The waste of iron at the positive pole is estimated at about 1 gramme per gallon of sewage acted upon. The hypochlorite of iron formed at the positive pole is acted on by the free ammonium, sodium, and potassium, and magnesium hydrates, and the ferrous hydrated oxide precipitated. This oxide of iron has the property of combining with organic matter. It appears to take up more organic matter than if precipitated chemically. The whole of the suspended matter appears to be carried with the iron oxide, together with a large proportion of the organic matter in solution. At first the oxidized matter is carried to the top by the hydrogen gas issuing from the negative pole This flocculent matter, however, soon subsides. If this process proves to be what is claimed for it, the next most important question will be how to dispose of sludge to the best advantage. This from London sewage amounts daily to about three thousand tons.

Yours, faithfully,

SAMUEL G. DIXON,

Professor of Hygiene, University of Pennsylvania.

Notes and Queries.

THE EFFECTS PRODUCED ON MAN BY SUBCUTANEOUS INJECTIONS OF A LIQUID OBTAINED FROM THE TESTICLES OF ANIMALS.

The communications recently made by Dr. Brown-Séquard to the Société de Biologie have attracted so much attention that we reprint in full Dr. Brown-Séquard's communication as published in the *Lancet* for July 20, 1889:

"There is no need of describing at length the great effects produced on the organization of man by castration, when it is made before the adult age. It is particularly well known that eunuchs are characterized by their general debility and their lack of intellectual and physical activity. There is no medical man who does not know also how much the mind and body of men (especially before the spermatic glands have acquired their full power, or when that power is declining in consequence of advanced age) are affected by sexual abuse or by masturbation. Besides, it is well known that seminal losses, arising from any cause, produce a mental and physical debility which is in proportion to their frequency. These facts and many others have led to the generally admitted view that in the seminal fluid, as secreted by the testicles, a substance or several substances exist which, entering the blood by resorption, have a most essential use in giving strength to the nervous system and to other parts. But if what may be called spermatic anæmia leads to that conclusion, the opposite state, which can be named spermatic plethora, gives as strong a testimony in favor of that conclusion. It is known that well-organized men, especially from twenty to thirty-five years of age, who remain absolutely free from sexual intercourse or any other causes of expenditure of seminal fluid, are in a state of excitement, giving them a great, although abnormal, physical and mental excitement. These two series of facts contribute to show what great dynamogenic power is possessed by some substance or substances which our blood owes to the testicles.

"For a great many years I have believed that the weakness of old men depended on two causes,—a natural series of organic changes and the gradually diminishing action of the spermatic glands. In 1869, in a course of lectures at the Paris Faculty of Medicine, discussing the influence possessed by several glands upon the nervous centres, I put forward the idea that if it were possible without danger to inject semen into the blood of old men, we should probably obtain manifestations of increased activity as regards the mental and the various physical powers. Led by this view, I made various experiments on animals at Nahant, near Boston (United States), in 1875. In some of those experiments, made on a dozen male dogs, I tried vainly, except in one case, to engraft certain

parts or the whole body of young guinea-pigs. The success obtained in the exceptional case served to give me great hopes that by a less difficult process I should some day reach my aim. This I have now done. At the end of last year I made on two old male rabbits experiments, which were repeated since on several others, with results leaving no doubt as regards both the innocuity* of the process used and the good effects produced in all those animals. This having been ascertained, I resolved to make experiments on myself, which I thought would be far more decisive on man than on animals. The event has proved the correctness of that idea.

"Leaving aside for future researches the questions relating to the substance or substances which, being formed by the testicles, give power to the nervous centres and other parts, I have made use, in subcutaneous injections, of a liquid containing a small quantity of water mixed with the three following parts: first, blood of the testicular veins;† secondly, semen; and, thirdly, juice extracted from a testicle, crushed immediately after it has been taken from a dog or a guinea-pig. Wishing in all the injections made on myself to obtain the maximum of effects, I have employed as little water as I could. To the three kinds of substances I have just named I added distilled water in a quantity which never exceeded three or four times their volume. The crushing was always done after the addition of water. When filtered through a paper filter, the liquid was of a reddish hue and rather opaque, while it was almost perfectly clear and transparent when Pasteur's filter was employed. For each injection I have used one cubic centimetre of the filtered liquid. The animals employed were a strong and, according to all appearances, perfectly healthy dog (from two to three years old), and a number of very young or adult guinea-pigs. The experiments, so far, do not allow of a positive conclusion as regards the relative power of the liquid obtained from a dog and that drawn from guinea-pigs. All I can assert is that the two kinds of animals have given a liquid endowed with very great power. I have hitherto made ten subcutaneous injections of such a liquid—two in my left arm, all the others in my lower limbs—from May 15 to June 4 last. The first five injections were made on three succeeding days with a liquid obtained from a dog. In all the subsequent injections, made on May 24, 29, and 30, and June 4, the liquid used came from guinea-pigs. When I employed liquids having passed through Pasteur's filter, the pains and other bad effects were somewhat less than when a paper filter was used.

"Coming now to the favorable effects of these injections, I beg to be excused for speaking so much as I shall do of my own person. I hope it will easily be understood that, if my demonstration has any value—I will even say any significance—it is owing to the details concerning the state of my health, strength, and habits previously to my experiments, and to the effects they have produced.

"I am seventy-two years old. My general strength, which has been considerable, has notably and gradually diminished during the last ten or twelve years. Before May 15 last I was so weak that I was always compelled to sit down after half an hour's work in the laboratory. Even when I remained seated all the time, or almost all the time, in the laboratory, I used to come out of it quite exhausted after three or four hours' experimental labor, and sometimes after only two hours. For many years, on returning home in a carriage by six o'clock after several hours passed in the laboratory, I was so extremely tired that I invariably had to go to bed after having hastily taken a very small amount of food. Very frequently the exhaustion was so great that, although extremely sleepy, I could not for hours go to sleep, and I only slept very little, waking up exceedingly tired.‡

"The day after the first subcutaneous injection, and still more after the two succeeding ones, a radical change took place in me, and I had ample reason to say and to write that I had regained at least all the strength I possessed a good many years ago. Considerable

* "This innocuity was also proved on a very old dog by twenty subcutaneous injections of a fluid similar to that I intended to employ on myself. No apparent harm resulted from these trials, which were made by my assistant, Dr. d'Arsonval."

† "For reasons I have given in many lectures in 1869 and since, I consider the spermatic as also the principal glands (kidneys, liver, etc.) as endowed, besides their secretory power, with an influence over the composition of blood, such as is possessed by the spleen, the thyroid, etc. Led by that view, I have already made some trials with the blood returning from the testicles. But what I have seen is not sufficiently decisive to be mentioned here."

‡ "I ought to say that, notwithstanding that dark picture, my general health is and has been almost always good, and that I had very little to complain of, excepting merycism and muscular rheumatism."

laboratory work hardly tired me. To the great astonishment of my two principal assistants, Drs. d'Arsonval and Hénocque, and other persons, I was able to make experiments for several hours while standing up, feeling no need whatever to sit down. Still more: one day (the 23d of May), after three hours and a quarter of hard experimental labor in the standing attitude, I went home so little tired that after dinner I was able to go to work and to write for an hour and a half a part of a paper on a difficult subject. For more than twenty years I had never been able to do as much.* From a natural impetuosity, and also to avoid losing time, I had, till I was sixty years old, the habit of ascending and descending stairs so rapidly that my movements were rather those of running than of walking. This had gradually changed, and I had come to move slowly up and down stairs, having to hold the banister in difficult staircases. After the second injection I found that I had fully regained my old powers, and returned to my previous habits in that respect.

"My limbs, tested with a dynamometer, for a week before my trial and during the month following the first injection, showed a decided gain of strength. The average number of kilogrammes moved by the flexors of the right forearm, before the first injection, was about thirty-four and a half (from thirty-two to thirty-seven), and after that injection forty-one (from thirty-nine to forty-four), the gain being from six to seven kilogrammes. In that respect the forearm flexors reacquired, in a great measure, the strength they had when I was living in London (more than twenty-six years ago). The average number of kilogrammes moved by those muscles in London in 1863† was forty-three (forty to forty-six kilogrammes).

"I have measured comparatively, before and after the first injection, the jet of urine in similar circumstances,—*i.e.*, after a meal in which I had taken food and drink of the same kind in similar quantity. The average length of the jet during the ten days that preceded the first injection was inferior by at least one-quarter of what it came to be during the twenty following days. It is, therefore, quite evident that the power of the spinal cord over the bladder was considerably increased.

"One of the most troublesome miseries of advanced life consists in the diminution of the power of defecation. To avoid repeating the details I have elsewhere given in that respect, I will simply say that after the first days of my experiments I have had a greater improvement with regard to the expulsion of fæcal matters than in any other function. In fact, a radical change took place, and even on days of great constipation the power I long ago possessed had returned.

"With regard to the facility of intellectual labor, which had diminished within the last few years, a return to my previous ordinary condition became quite manifest during and after the first two or three days of my experiments.

"It is evident from these facts and from some others that all the functions depending on the power of action of the nervous centres, and especially of the spinal cord, were notably and rapidly improved by the injections I have used. The last of these injections was made on June 4, about five weeks and a half ago. I ceased making use of them for the purpose of ascertaining how long their good effects would last. For four weeks no marked change occurred, but gradually, although rapidly, from the 3d of this month (July) I have witnessed almost a complete return of the state of weakness which existed before the first injection. This loss of strength is an excellent counterproof as regards the demonstration of the influence exerted on me by the subcutaneous injections of a spermatic fluid.

"My first communication to the Paris Biological Society was made with the wish that other medical men advanced in life would make on themselves experiments similar to mine, so as to ascertain, as I then stated, if the effects I had observed depended or not on any special idiosyncrasy or on a kind of auto-suggestion without hypnotization, due to the conviction which I had before experimenting that I should surely obtain a great part at least of these effects. This last supposition found some ground in many of the facts

* "My friends know that, owing to certain circumstances and certain habits, I have for thirty or forty years gone to bed very early and done my writing work in the morning, beginning it generally between three and four o'clock. For a great many years I had lost all power of doing any serious mental work after dinner. Since my first subcutaneous injections I have very frequently been able to do such work for two, three, and one evening for nearly four hours."

† "I have a record of the strength of my forearm, begun in March, 1860, when I first established myself in London. From that time to 1862 I occasionally moved as much as fifty kilogrammes. During the last three years the maximum moved was thirty-eight kilogrammes. This year, previously to the first injection, the maximum was thirty-seven kilogrammes. Since the injection it has been forty-four."

contained in the valuable and learned work of Dr. Hack Tuke on the "Influence of the Mind over the Body." Ready as I was to make on my own person experiments which, if they were not dangerous, were at least exceedingly painful, I refused absolutely to yield to the wishes of many people anxious to obtain the effects I had observed on myself. But, without asking my advice, Dr. Variot, a physician who believed that the subcutaneous injections of considerably diluted spermatic fluid* could do no harm, has made a trial of that method on three old men,—one 54, another 56, and the third 68 years old.† On each of them the effects have been found to be very nearly the same as those I have obtained on myself. Dr. Variot made use of the testicles of rabbits and guinea-pigs.

"These facts clearly show that it was not to a peculiar idiosyncrasy of mine that the effects I have pointed out were due. As regards the explanation of those effects by an auto-suggestion, it is hardly possible to accept it in the case of the patients treated by Dr. Variot. They had no idea of what was being done; they knew nothing of my experiments, and were only told that they were receiving *fortifying* injections. To find out if this qualification had anything to do with the effects produced, Dr. Variot, since the publication of his paper, has employed similar words of encouragement, while making subcutaneous injections of pure water on two other patients, who obtained thereby no strengthening effect whatever.‡

"I believe that, after the results of Dr. Variot's trials, it is hardly possible to explain the effects I have observed on myself otherwise than by admitting that the liquid injected possesses the power of increasing the strength of many parts of the human organism. I need hardly say that those effects cannot have been due to structural changes, and that they resulted only from nutritive modifications, perhaps in a very great measure from purely dynamical influences exerted by some of the principles contained in the injected fluid.

"I have at present no fact to mention which might serve to solve the question whether it would be possible or not to change structurally muscles, nerves, and the nervous centres by making during a good many months frequent injections of the fluid I have used. As I stated at the Paris Biological Society, I have always feared, and I still fear, that the special nutritive actions which bring on certain changes in man and animals, from the primitive embryonal state till death by old age, are absolutely fatal and irreversible. But in the same way that we see muscles which have from disease undergone considerable structural alterations regain sometimes their normal organization, we may, I believe, see also some structural changes not essentially allied with old age, although accompanying it, disappear to such a degree as to allow tissues to recover the power they possessed at a much less advanced age.

"Whatever may be thought of these speculations, the results I have obtained by experiments on myself and those which have been observed by Dr. Variot on three old men show that this important subject should be further investigated experimentally."

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*"In my third communication at the Biological Society, I said that both the intense pain each injection has caused me and the inflammation it has produced would be notably diminished if the liquid employed were more diluted. The three cases of Dr. Variot have proved the exactitude of my statement. He made use of a much larger amount of water, and his patients had to suffer no very great pain and no inflammation."

†"The paper of Dr. Variot and my remarks upon it have appeared in the *Comptes-Rendus de la Société de Biologie*, No. 26, 5 Juillet, 1889, pp. 451 and 454."

‡"Since writing the above I have received a letter from Dr. Variot announcing that, after injecting the liquid drawn from the testicles into these two individuals, he has obtained the same strengthening effects I have myself experienced."

STERILIZING MILK.

The question of sterilizing milk is one of special importance in relation to the well-being of children, to whom this commodity forms the staple food, especially during the hot days of summer. The process can be readily carried out without putting the householder to the expense of purchasing some special sterilizing apparatus. All that is necessary is to obtain some bottles capable of containing the milk which will be consumed during the day, each bottle being large enough to hold the quantity which will be used at one time. Absolute cleanliness being an essential feature in this particular, these bottles and their corks should be thoroughly sterilized by being boiled in a solution of washing soda. When the milk is brought to the house it should be placed in bottles, the latter afterwards being arranged on a wire frame in a pot of water and then boiled for fifteen minutes. The bottles should then be immediately securely corked and placed in a refrigerator with the ice upon them.

These small details are perfectly simple and could be readily carried out, if only the nurse or the parent could be made to appreciate the necessity of giving children milk which is free from "germ"-life. But the effect of sterilizing milk, if it became a routine process in family households, would be of course of great service in affording protection against scarlet fever, typhoid fever, and other diseases whose propagation by means of milk under certain circumstances has been known to occur.—*Medical Press*, August 7, 1889.

POISONING BY POTATOES.

In the *Journal de Médecine et de Chirurgie Pratiques* for August, 1889, DR. CORTIAL gives an account of serious symptoms of poisoning which occurred in one hundred and one members of a battalion of infantry. The symptoms were headache, dilatation of the pupils, colic, diarrhœa, sweating, fever, pain in the epigastrium, vertigo, nausea, thirst, troubles of vision, and cramps.

The poison was evidently contained in the food, and, after successive eliminations, suspicion rested upon the potatoes, which were withheld for forty-eight hours, with the result that no new cases developed. It was found on examination that the potatoes simply consisted of sprouts, which, as is well known, contain solanine, an alkaloid of a poisonous character, and which produces results similar to those detailed above.

In these cases the average duration of the indisposition was four to five days, although in some it lasted somewhat longer, with persistence of the diarrhœa. As the cause of the affection was not recognized, and the effects did not appear until eight or ten hours after the meal, it was too late for evacuating medicine, and ether and laudanum were given, and the patients confined to a milk diet.

INCUBATION PERIOD OF MEASLES.

M. H. LEROUX (*La France Médicale*, No. 89) relates cases of measles in which it was fairly evident that the usual period of incubation (twelve to fourteen days) had been exceeded. In one case a child, aged 7 years, who was sent into the country the day following the appearance of the rash on his sister, developed the rash himself twenty days later. In another a school-girl, while suffering from an attack of scarlatina was also incubating measles. For the scarlatina developed on March 29; the fever declined on April 10; but on the 14th she again complained of sore throat, had coryza, etc., and on the 15th showed measles rash. She had been separated from her school-fellows for nineteen days, and either the measles had an incubation period of at least this duration, or it must have been conveyed to her while suffering from scarlet fever. The third case was one of a boy of 8 years, who had been isolated from a younger sister suffering from measles, and who did not exhibit the rash himself until twenty days afterwards. Of course in each case the contagion might have been conveyed by a third person, but M. Leroux is perfectly satisfied that this did not take place. The second case is remarkable as an instance of concurrence of two specific infective disorders.—*Lancet*, August 17, 1889.

THE CONSTITUENTS OF THE JUICE OF ANTIARIS TOXICARIA.

The milky juice of *Antiaris toxicaria*, used as arrow-poison in the East Indian Archipelago, contains, according to H. W. BETTINK, at least three active principles, which seem to be closely allied to each other (*Ned. Tijdschr. v. Pharm.*). The most important of these, antiarine ($C_{14}H_{20}O_{50}$), is precipitated from its solutions by tannin, but only in a state of indissoluble combination with other substances. When the dried juice has been treated with petroleum ether or benzole, the resin, the fat, and the india-rubber-like portion removed, and the residue extracted by alcohol, a thick fluid remains, from which the antiarine separates in the form of crystals. These represent about 1.7 per cent. of the dry, or .6 per cent. of the fresh, juice. According to Tichmann, they belong to the rhombic system. By sulphuric acid they are colored light brown and decomposed. Dogs and rabbits are killed in a few minutes by a dose of ½ milligramme injected into the blood. The second constituent is obtained from the same syrupy mass or mother-liquid, by drying it on a water-bath, letting it stand for twenty-four hours, and then stirring it up with small quantities of water, during which process more of the antiarine crystals will be separated. After they have ceased to form, a substance may be thrown down by diluting the mother-liquid with water, and adding a solution of tannin. This substance, for which the name œpäin has been proposed, very closely resembles antiarine in its physiological effects, and gives the same reactions with acids, but differs in being very soluble

in water and in its behavior towards tannin. The third constituent of the juice—also non-crystallizable, easily soluble in water and alcohol, but not precipitated by tannin—is called toxicarine. The author promises further communications upon the subject.—*Druggists' Circular*, September, 1889.

THE FIRST SOUND OF THE HEART.

The part recently issued of the *Archiv für Anatomie und Physiologie* contains a paper by DR. LUDOLF KREHL, in which, from investigations conducted in the Physiological Institute of Leipsic, he has arrived at the conclusion that the contraction of the cardiac muscular fibres is the principal cause of the first sound, instead of being, as is now generally admitted, merely an accessory cause, or, as some will have it, entirely inoperative. The part played by each of these factors in the production of the sound can only be finally determined when the intensity of the full sound is ascertained, as well as the intensity of the several possible factors. But the difficulties of the case are well known; for while, on the one hand, the systole of the heart is found to consist of a single and sudden contraction, which it is held can produce no sound, since it produces only a single wave, and while it is rendered indistinct by the incompetency of the auriculo-ventricular valves; on the other hand, such experienced observers as Ludwig and Dogiel have satisfied themselves that under circumstances in which the sudden tension both of the auriculo-ventricular valves and of the vascular walls is impossible, the first sound is still indubitably inaudible, from which it would appear that one, if not the chief, agent in its production is the muscular sound. The researches of Krehl were undertaken to test the truth of Ludwig and Dogiel's observations under conditions in which the play of the valves was still more stringently prevented, and this he believes he has accomplished by the employment of an ingeniously-constructed little apparatus, consisting of a tube, from the extremity of which an expanding crown can be protruded, and by this means, when the instrument is introduced into the cavity of the heart, the valves can be firmly pressed back against the walls of the arteries. The animals used were dogs, and while after the insertion of the instrument one observer auscultated the heart, another alternately pressed in and withdrew the crown. The results obtained were that when the auscultator knew that the crown was thrust out and the valves compressed against the arterial walls, he perceived that the systolic sound was duller and a little less strong; but when with averted face he was unaware of the position of the crown, he was unable to distinguish any difference between the periods when the valves were acting and when they were not acting. This result obtained incidental confirmation by the fact that in all instances as the animals bled to death the second sound disappeared, while the first sound was still for some time distinctly audible; and additional evidence is to be found in the circumstance that, when in such cases the ventricle had ceased to contract and the auricle alone acted, a sound was clearly perceptible,—that is, when the play of the valves had certainly ceased. He does not consider that he has been able to determine from his investigations whether the cardiac contraction is a simple convulsion or a tetanus, but he thinks that the sound may arise from the friction of the muscular fibres against each other; and this is supported by the observation of Dr. MacWilliam, that a sound is audible on simple convulsion or spasm of the voluntary muscles.—*Lancet*, August 24, 1889.

SOME NEW DRUGS.

Naregamia Alata.—This new drug, described for the first time by Hooker, has for some time been largely employed in the General Hospital in Vienna. The active principle was discovered by Hooker, and by him named naregamine. It is an alkaloid which forms crystallized salts, with sulphuric, nitric, and hydrochloric acids. In addition to this alkaloid the bark of the rhizome contains wax, gum, asparagine, starch, but no tannin.

The natives on the coast of Malabar, where this plant is indigenous, employ it as an emetic, and as a remedy in bilious conditions, rheumatism, and digestive disorders. It has likewise been recommended in dysentery and in bronchial catarrh. In the General Hospital at Vienna this remedy is employed under the form of a fluid extract, or it may be given in the form of pills or of tincture. The dose of the fluid extract is stated to be from 30 to 50 drops, in water flavored with laurel-water.

Xanthoxylon Senegalense (artar-root).—Giacose and Soave have found four alkaloids in the bark of this plant, one of which, artarine, closely resembles berberine in constitution. —*Les Nouveaux Remèdes*, July 24, 1889.

—THE—

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ON THE TREATMENT OF PUERPERAL CONVULSIONS.

By E. P. Hurd, M.D., Newburyport, Mass.

THERE is no calamity connected with the puerperal state so alarming as convulsions. Eclampsia and placenta prævia (the mortality of these two accidents of pregnancy and parturition being formerly about equal) must always be the terror of the obstetrician, but puerperal convulsions will always inspire most dread in a household.

My first case of puerperal eclampsia was in 1867, when I was a young practitioner. I was summoned four miles into the country, and found my patient, a plethoric woman, in convulsions. I was obliged to send home for forceps and chloroform, and while waiting for these I bled the patient from the arm, abstracting a quart of blood. As soon as I obtained my forceps, I administered chloroform, and delivered the patient of a dead child. Calomel and opium were administered, a grain of each every hour (Churchill). The convulsions returned after a respite of two hours. Though I had chloroform enough with me, I dared not administer it freely, especially as I had to contend with the expostulations of the family and other attendants. After six hours of almost continuous paroxysms, the patient succumbed.

The anæsthetic treatment was just then coming into vogue.

In the fall of 1868 I attended a meeting of the Eastern Townships Medical Society in Sherbrooke, Province of Quebec, and heard an address by Dr. F. W. Gilbert, of Hatley, Stanstead County, on "Puerperal Convulsions." Dr. Gilbert advocated an almost exclusive treatment by chloroform. His method was to push the chloroform to full anæsthesia, and so to keep the patient under its influence that, while the use of the drug was from time to time interrupted during the cessation of the fits, a few whiffs of the chloroform vapor would be sufficient to arrest any twitches of the facial and ocular muscles, the immediate precursors of the eclamptic seizure.

Dr. Gilbert read notes of twenty cases which had come under his observation during a practice of upward of ten years in Stanstead County; these had all been treated by chloroform without bleeding, and all had recovered. He stated his belief that the proximate cause of puerperal eclampsia was reflex hyperexcitability of the spinal cord, which was better controlled by chloroform than by any other remedy.

Since that date I have had upward of twelve severe cases; a part of these were reported in the *Medical Record*, September 14, 1878. I have always placed my principal reliance on ether or chloroform, and thus far all my cases of puerperal convulsions have recovered. I have not bled once, nor have I made much use of chloral.

The following case is reproduced from the *Medical Record*. It is a fair sample of cases which I have seen.

"In 1875, Mrs. W., a primipara, albuminuric, with excessive œdema. Labor was progressing finely, with dilatable os, when a violent convulsion came on. I applied ether, and sent home for forceps. The ether promptly allayed the convulsions. I kept the sponge, saturated with the anæsthetic, near the mouth of the patient for six hours. Delivered her by forceps of a living child within an hour of the invasion of the fit. There was no return of convulsions. Perfect anæsthesia was not kept up during all of the long period mentioned; it was only when warning was given by restlessness and facial spasm of an impending general outbreak, that the ether was pushed to its fullest physiological effect. A fair degree of anæsthesia, however, was maintained during the whole period. And here, I believe, is the secret of the success of the anæsthetic treatment; no timidity must be shown; the ether or the chloroform must be used unsparingly and perseveringly; the erethism of the bulbus and spine must be annihilated, or it will annihilate the patient."

In 1883 I attended a case of puerperal convulsions with Dr. F. A. Hale. The patient was of the stout, plethoric kind, such a one as, theoretically, should be bled, and bled freely. The baby (dead) was delivered by forceps immediately after the first convulsion. This woman was kept almost constantly under chloroform for eighteen hours. If we allowed her to come out from the influence of the anæsthetic, general convulsions were sure to supervene. These convulsions, when permitted to make headway, ended in an asphyxiated, cyanotic, syncopal condition, which seemed to menace instant death. There was no safety but in sitting by the patient, sponge in one hand and the chloroform-bottle in the other, ready, on the least warning, to press the anæsthetic. In fact, a good part of the time the sponge, with a few minims of chloroform on it, was kept a few inches from the mouth of the patient. We pursued this treatment three full hours after all convulsive action had ceased. This patient (who had remained unconscious from midnight till 9 P.M.) made a good recovery. But here comes a very aggravating circumstance. We got no credit for saving this woman's life. A Christian scientist (against our wishes) had been allowed access to the house, and even to the room of the sick woman. He remained several hours in the house during the afternoon, and claimed the credit of the cure. This was freely awarded him by the parents and husband of the sick woman! "*Sic vos non vobis vellera fertis oves!*"

In the *Medical Record* aforesaid is a brief report of nine cases of puerperal convulsions occurring in the practice of Dr. G. W. Snow, of this city. All made a good recovery under ether; no other remedy was used.

The late Dr. Enoch Cross, of Newburyport, after more than fifty years of active practice, wrote me as follows: "I have had experience in all kinds of treatment of that dire disease. In my earlier years, I used to witness disastrous results, but since I have trusted to ether, have had uniform success."

Similar testimonials to the efficacy of the anæsthetic treatment have been presented by other of my *confrères*,—Dr. F. A. Howe, Dr. J. F. Young, Dr. John Crowell, Dr. J. J. Healy, Dr. D. W. Colcord, etc. The latter

tells me that in all his recent cases he has trusted to ether, and has saved all his patients.

Professor Braun, of Vienna, records sixteen cases treated by chloroform; all recovered. Chailly Honoré (1859) relates that eighteen out of nineteen cases which he treated by chloroform got well.

The use of anæsthetics in puerperal convulsions now rests on a solid basis of clinical facts, and a practitioner who neglects this mode of treatment when chloroform or ether is to be had, comes little short of criminality.

In the puerperal state we have inordinate irritability of the entire reflex cerebro-spinal system; we have an active poison in the blood keeping up that irritability; we cannot speedily depurate the blood of that poison, but we can protect the central nervous system from its influence, and we can reduce to a minimum that reflex excitability. "The evidence in favor of chloroform in puerperal convulsions," says Barnes,* "has been greatly accumulating since Simpson's time. It should be carried to the surgical degree,—that is, to the extent of rendering the spinal cord irresponsive to irritation of the sphincters. The convulsive fit is rendered less violent, and it is shortened. When anæsthesia is induced in anticipation of a fit, this may be almost entirely averted, and is sure to be moderated. . . . An essential condition for obtaining from chloroform the full benefit it is capable of giving, is to keep close watch over the patient, so as to administer it on the slightest warning of a fit."

"I have never," says Phillips, obstetric physician to Guy's Hospital, "witnessed any untoward symptoms from chloroform in these cases, though I have administered it continuously for several hours, and sometimes when the patient was already in a deep comatose condition between the attacks."† It is almost needless for me to add that this has been my own experience.

The choice between ether and chloroform must be left to the individual practitioner. Chloroform is certainly more speedy, and makes a more profound impression than ether; it has been generally regarded as safe when administered in eclampsia. At least, I am not aware of any death ever having occurred from the use of chloroform on such an occasion. Nevertheless, there is a wide prejudice against this anæsthetic, and there are practitioners who will never consent to employ it under any circumstances.

* Braithwaite's Ret., Part LXVIII. p. 222.

† "Guy's Hosp. Rep.," 1870–1871, p. 343.

GENERAL CONSIDERATIONS ON PUERPERAL ECLAMPSIA, ADJUVANTS TO THE ANÆSTHETIC TREATMENT.

In discussing the treatment of puerperal convulsions, the pathogeny of this disease, and the leading indications to be met, should be clearly kept in view. It is, of course, well understood that the pregnant or puerperal woman is liable to convulsions from the same causes which produce convulsions in the woman who is not pregnant. Thus, a hysterical woman may have convulsions of a decidedly hysterical character during pregnancy. These fits are of much less serious import than those of true eclampsia. It is generally not difficult, from the nature of the convulsions and the antecedents of the patient, to decide as to the diagnosis. The fits are lighter and less general, the coma is less profound, or absent altogether, in hysterical convulsions. The frothing at the mouth and the biting of the tongue, the heavy, stertorous breathing after the fit, which distinguish albuminuric eclampsia, are not present in the hysterical. Moreover, the urine is not albuminous, and there is freedom from anasarca; there is not even œdema about the ankles; lastly, the antecedents of the patient show the hysterical constitution. Hysterical convulsions are more frequent during the earlier than during the later months of pregnancy, but they may come on at the close of gestation, as a result of trifling causes, such as excessive fatigue and want of sleep, and disordered digestion. In one of my patients, Mrs. C., living on Strong Street (March, 1883),‡ the convulsions were plainly of the hysterical kind. This was a delicate, nervous woman; had all her lifetime had hysterical fits from trifling causes; when labor came on, every pain was followed by twitching of the facial muscles, jerking and contortion of the limbs; the patient was with difficulty kept from throwing herself off from her bed; after the fit, consciousness speedily returned. These fits so interfered with the progress of the labor, that I was obliged to keep the patient under chloroform for several hours. The presentation was high and the os undilated. I, however, succeeded, after a while, in performing digital dilatation, which enabled me to introduce my hand, when I turned, and delivered her of a living child. For several days after confinement I had to

‡ Dr. A. B. Dearborn attended this case with me.

keep Mrs. C. under the influence of chloral, on account of the tendency to recurrence of the fits.

In the treatment of hysterical convulsions, occurring during labor, the use of anæsthetics is just as much indicated as in albuminuric eclampsia, though the anæsthetic need not be pushed to the same extent.

An epileptic patient is likely to have the customary crises during pregnancy and about the time of parturition. There is a marked resemblance between the eclamptic and epileptic seizure, but the history of the case, the examination of the urine, the absence of anasarca, etc., will plead in favor of the epileptic origin. It is, I think, seldom that true epilepsy complicates labor; when it does, it is not of serious import. Dewees's and Churchill's division of puerperal convulsions into hysteric, epileptic, and apoplectic, is, from the standpoint of more modern science, objectionable. His epileptic and apoplectic varieties constitute the eclampsia proper of recent writers.

It is now agreed that the great majority of cases of convulsions occurring about the time of parturition are associated with albuminuria, general œdema, and renal insufficiency.

Frerichs, in 1851, was one of the first to point out the close resemblance between the convulsions occurring in pregnancy and the uræmic convulsions of Bright's disease. His conclusions, to which nearly all subsequent investigators have given their assent, are: "That true eclampsia occurs only in pregnant women suffering from Bright's disease, and it bears to the latter the same causal relation as convulsions and coma in Bright's disease in general. It is the result of the uræmic intoxication, with which also in its mode of manifestation it agrees."*

According to this view, then, the dominant pathogenic lesion is renal insufficiency, the exciting cause, uræmic blood-poisoning; or, in other words, retained urinary excrement irritates the spinal motor centres and provokes convulsions. By uræmia, we, of course, understand, with Bouchard, "A complex kind of poisoning, in which participate all the poisonous principles introduced into or originating in the organism." But when we have said that these poisonous principles produce convulsions by irritating the spinal cord, we have not said all. The cerebrum is also affected, as is evidenced by the loss of consciousness. This last phenomenon is better accounted for by the hypothesis of anæmia of the hemispheres from contraction of the arterioles than by any other hypothesis, as Lusk has well shown. Deiters has, moreover, demonstrated "that the motor fibres of the extremities and trunk have their first central termination in the pons," while Nothnagel has proved "that a collection of ganglionic cells in the substance of the pons furnishes the motor centre from which the convulsive impetus takes its departure."† The theory, then, is that the centres of the muscles of animal life in the mesocephalon and cord are irritated by poisoned blood, and that the arterioles which supply the cerebral cortex are in a state of tonic contraction, owing to the same cause acting on their vasomotors.

It is quite possible that in fatal cases of puerperal eclampsia, the brain may sometimes be found the seat of apoplectic effusion, owing to the giving way of fragile blood-vessels during the strain imposed upon them by the fit. In plethoric women, the blood-pressure is often high during the paroxysm. The veins of the cephalic extremity are turgid with blood, owing to the restraint put upon the return circulation by the convulsed muscles, and intra-cranial rupture is very likely to take place. This fact, however, does not justify the establishment of an apoplectic variety, nor does the existence of coma, however profound, and stertorous breathing, nor do even the results of numerous post-mortem examinations. Angus Macdonald reported, in 1878, "that in the examination of the brain in eclamptic persons, he found the meninges congested and the venous sinuses filled with blood, while at the same time there was marked anæmia in the deeper layers of the brain structure. The ventricles . . . were found full of serum."‡

Assuming, then, that, except in rare cases, where the convulsions can be traced to peripheral irritation in the nervous or exhausted (with or without the hysterical disposition), the true pathogeny of puerperal eclampsia is uræmic poisoning, the leading indications in prophylaxis are to combat the renal insufficiency, cause of the uræmia, and promote elimination by the kidneys and other emunctories. The amount of work imposed upon the kidneys may be lessened by ordering a milk diet, by limiting the amount of proteids in the food, and by the free use of saline cathartics (Glauber salts, Carlsbad

* "Lusk's Midwifery," p. 530.

† Lusk, *loc. cit.*, p. 534.

‡ Lusk, *loc cit.*, p. 534.

salt, Rubinat water). The physician should, as far as possible, obtain information as to the amount of urine passed daily by his patient, and any indication of suppression of the renal function should be at once met by the proper remedies, and even by the induction of labor, if uræmic symptoms should supervene. The patient should be guarded from colds and from attacks of indigestion, and full doses of the tincture of the chloride of iron should be given three times a day, as Lusk recommends, "for its diuretic and hæmatinic properties, and likewise to improve the tone of the weakened vessels." It is possible that in some cases jaborandi, or its alkaloid, pilocarpine, may be used with benefit to promote diaphoresis when the kidneys are secreting but little urine. I am aware that some writers rely on jaborandi when the eclampsia has declared itself (see a valuable article by Dr. Everett S. Warner in the *Medical Record*, July 12, 1879, also another in the same volume of the *Record* by Dr. E. E. Mather). I do not, however, think that this mode of treatment will ever be a popular one, at least to the exclusion of anæsthetics.

The occasions justifying the induction of premature labor, according to Tyson,* are two in number:

1. In Bright's disease, complicating pregnancy, where puerperal convulsions attended nephritis in a previous pregnancy.

2. In all primiparæ where Bright's disease had existed prior to pregnancy. Here premature labor should be induced as soon as the fœtus is viable.

Tyson mentions an additional class of cases, where uræmic symptoms have suddenly made their appearance. Such a patient I saw last winter (January, 1889) with Dr. J. Q. Adams, of Amesbury. This woman (Mrs. S.) had had a previous delivery, which was perfectly natural. When she came under Dr. Adams's care, she was pregnant seven months. The prominent symptoms were obstinate and incoercible vomiting, and a condition of stupor, from which the patient was not easily aroused. The urinary secretion was scanty, and on two examinations, made by a competent chemist, was found to contain less than half the normal quantity of urea. Finally, there was for twenty-four hours entire suppression of the renal function. Dr. Adams very properly brought on labor by artificial dilatation of the os, ridding the woman of a dead child. The patient was comatose when I saw her. We injected subcutaneously alternately caffeine and tincture of digitalis, giving internally calomel, the only medicine that could be retained. Mrs. S. had slight convulsive seizures for several successive days. Under the caffeine and digitalis injections the pulse (which had been very feeble) rose, and the kidneys resumed their tasks. The third day after delivery, the quantity of urine had become nearly normal. Recovery gradually took place.

Relation of the Gravid Uterus to the Eclampsia.—Whatever theory may be entertained concerning the relation of the gravid uterus to the eclampsia, whether in some instances the compression which the uterine tumor exercises on the renal vein may produce in the long run a hyperæmia, then an inflammation of the kidneys, as Rayer supposes,—or whether the renal stasis is brought about by direct pressure on the kidneys themselves, or the ureters, the primiparous state with very resistant abdominal walls favoring the pressure (Cazeaux),—certain it is that pregnancy and Bright's disease seem, in the cases under consideration, to sustain a causal relation to each other,—a relation so intimate that the cessation of the pregnancy is followed by speedy amelioration of the symptoms caused by the disease, if not by complete recovery. Hence, in cases of puerperal convulsions, there is every interest in speedily clearing the womb of its contents, and this I would regard as the leading indication. Labor must be brought on, or completed as speedily as possible, by forcible dilatation of the os, if need be, by turning, or by the use of forceps.

A second indication is to abolish reflex spinal excitability. This has been already alluded to, and the utility of anæsthetics considered. I need not return to the subject of anæsthetics. Morphine injections have lately come into vogue. Dr. Clark, of Oswego, N. Y., was, I believe, one of the first to advocate the free use of hypodermic morphine in puerperal eclampsia. His article in the *American Journal of Obstetrics*, published in 1880, made considerable impression in this country. I have not his paper by me, but I remember that he advised hypodermic injections of morphine,—¼ to ½ grain,—frequently repeated, till, it may be, two or three grains were administered. The patient was to be as speedily as possible brought under the sedation of the morphine. Professor G. Veit, in the *Prager Medizinische*

* Am. Med. Ass. (meeting June 27, 1889).

Wochenschrift, states that he has employed these injections in many cases with success. In order to produce narcosis, he was in the habit of combining subcutaneous injections of morphine with the inhalation of chloroform. The initial dose of morphine was ½ grain, and this was followed by still larger doses. In one case, he gave about 3 grains in the course of the twenty-four hours.

This kind of treatment has become very popular, and I am inclined to think that many practitioners in this country are in the habit of placing greater reliance on hypodermic injections of morphine, or morphine and atropine, than on the free use of anæsthetics.

Dr. G. W. Orr, of Michigan, reports in the *Medical Record*, vol. xxi., a case in which two hypodermic injections of ¼ grain morphine, one hour apart, arrested the convulsions in a very obstinate case. He asserts that chloroform had failed.

Nevertheless, the following remarks may be in order:

1. Morphine does not act with that certainty in allaying spinal excitability that absolute reliance can be placed on it.

2. It may even increase the medullary erethism by increasing congestion of the cerebro-spinal axis. Hypodermic morphine is "a sharp-edged tool," which may do the utmost harm, instead of doing the good desired. I am myself afraid of these large hypodermics of morphine in puerperal eclampsia, with deep coma and apoplectic tendencies.

3. Morphine cannot procure any sedation that cannot equally well, and with greater safety, be obtained by chloroform, pushed to complete anæsthesia.

Veratrum Viride.—At a meeting of the Iowa State Medical Society, held January 27, 1880,* Dr. G. M. Staples, of Dubuque, read a paper on "A New Method of arresting Puerperal Eclampsia," in which he claims to have promptly arrested puerperal convulsions with uninterrupted success for nine years past with hypodermic injections of veratrum and aconite, every twenty to thirty minutes, until the system was brought under their influence. Average dose, 4 to 6 drops of the former and 2 to 3 of the latter.

Norwood's tincture of veratrum and the officinal tincture of aconite root were the preparations employed. Effects, he says, will be observed in fifteen minutes, and no ill results have been experienced from the punctures. He reports three cases in full from among those treated in this manner, in which the results were most gratifying. In all three post-partum convulsions were present; patients were profoundly comatose; spasms were frequently recurring, and in one all other remedies had been exhausted in vain. He finds the two drugs combined more efficacious than the veratrum alone, while a smaller dose is required.

In the May number of the *American Journal of Obstetrics*, 1871,† Dr. H. Fearn, of Brooklyn, contributed an article on "Veratrum Viride in Large Doses as a Substitute for Blood-letting in Puerperal Convulsions," in which he recommended the tincture of veratrum in doses varying from 15 minims to a teaspoonful, repeated every five or ten minutes until the pulse became soft or vomiting set in. For several hours after the convulsions are arrested, he advises the veratrum to be administered in smaller doses, in order to keep the pulse below fifty to the minute. It reduces arterial tension better than bleeding.

It is claimed that this remedy is without danger, but considering the cardiac depressant properties of veratrum viride, it is not probable that the profession generally will ever be persuaded of the safety of these large doses, and prefer this drug to chloroform.‡

Blood-letting.—There is still a general consensus among medical authorities as to the utility of blood-letting as an adjuvant to other measures designed to lower arterial tension and lessen the irritation of the vasomotor and convulsive centres. Lusk states the advantages of venesection very fully. It is rapid in its action; it lowers vascular tension and depresses motor excitability; it favors absorption, and renders the patient more susceptible to the influence of other remedies. The quantity of blood to be abstracted varies from eight to sixteen ounces, which should be taken from the arm *plenorivo.*

Tyson places blood-letting in the very first rank of remedies to be used in puerperal eclampsia.§ "Afterwards, or coincidently with this measure, anæsthetics are often of

* *Medical Record*, vol. xvii. p. 211.

† Quoted from "Lusk's Midwifery," p. 537.

‡ For further recommendations of veratrum viride, see *Medical Record*, 1876, p. 450. Dr. Battey states that in Georgia it is highly esteemed in puerperal eclampsia. He would feel reluctant to prescribe it in ½-drachm or drachm doses. Such doses are not devoid of danger.

§ *Medical News*, May 1, 1886.

great service, and the patient is kept with great advantage more or less thoroughly under the influence of chloroform or ether." From this it will be seen that he would make the anæsthetic an adjuvant to bleeding.

It is needless to multiply citations to show the present status of the profession relative to bleeding in puerperal eclampsia. The medical journals teem with cases where bleeding coincidently with other remedies was tried, and where the patients for the most part got well. If we go back to "Dewees's Text-Book," we shall find him advocating bleeding, even in the anæmic and hysterical.* The modern obstetrician selects his cases. He would not bleed the anæmic and neurasthenic; he reserves the lancet for the robust and plethoric, and especially for cases with sharp, bounding pulse, high, arterial tension, and apoplectic tendencies. Singularly enough, I have failed to see such cases, except very rarely. Were such cases to present themselves, I should not hesitate to bleed. The loss of sixteen, twenty, thirty-two ounces of blood in the puerperal condition is often of no great consequence. Many spare women lose more than that quantity the first day or two after parturition. And yet, as I have above intimated, my patients have too often been anæmic, debilitated, neurasthenic, to make bleeding warranted, even in the writhings of eclampsia. Besides, with chloroform and its adjuvants, chloral and free purgation, I have seemed to have all the therapeutic armor which I needed. It has appeared to me, in fact, that I have obtained from chloroform pushed to anæsthesia just the effect on the circulation and sensory, vaso-motor, and muscular innervation which is claimed for bleeding. After a brief period of excitement, the subject falls into a state of collapse and complete anæsthesia. The muscles, before in a state of tonic or clonic contraction, enter into resolution. The last muscle paralyzed is the masseter; sometimes it is still in a state of spasm when all the other muscles are in resolution. The sensibility disappears totally, the reflexes are abolished, the pulse is slowed and enfeebled.† Schiff has shown that the vascular pressure is markedly diminished under chloroform inhalations, so that chloroform seems to give the principal advantages which are sought from the lancet. Moreover, the results of chloroform alone in eclampsia have been far more successful than the results of bleeding alone. According to Charpentier,‡ the mortality in the hospitals of Paris from bleeding alone has been forty-five per cent.; from chloroform alone, eleven per cent.

Perhaps the wiser, safer course will be, in suitable cases, to associate anæsthesia with moderate bleeding. Chloroform, during the brief period of excitement following its administration, raises the pulse and the arterial tension. It is possible that, in cases of high, vascular pressure (as in the robust and plethoric, or in interstitial nephritis), this temporary increase of blood-pressure might be detrimental. If bleeding be first practised, the subsequent administration of chloroform would be safer.

In concluding what I have to say under this head, it will be proper to allude to some of the objections which have been raised to the use of chloroform in eclampsia. It has been said to be irrational "because it produces congestion of the nerve-centres, and may thus increase that cerebro-spinal congestion, which is already so much dreaded in eclampsia." "Chloroform increases the asphyxia of eclamptic subjects already predisposed to this complication," and its use "has been followed by puerperal mania."§ Such objections as these are advanced by Depaul, who does not hesitate to withdraw three quarts of blood from an eclamptic patient, thinking thus to "render the spinal bulb anæmic and deaden reflex irritability." As Charpentier well observes, "It is to be feared that depletion, carried beyond certain limits, may itself become a cause of irritation to the brain and cord, as is the case after profuse hemorrhages, of which the final symptoms are almost always convulsive." "Bleeding also impoverishes the blood of an eclamptic patient," and "forces her into a chloro-anæmic state, the intensity and persistency of which may give rise to great alarm."‖

On the whole, I believe that the dangers apprehended from the free use of chloroform are more imaginary than real, and that the ill effects which may possibly arise from its prolonged use are far less than those which are likely to attend free bleeding, or even the unstinted exhibition of morphine hypodermically, whose paralyzing action on the central innervation is of so much longer continuance.

* "Dewees's System of Midwifery." Philadelphia, 1828.

† Dujardin-Beaumetz, "Dictionnaire de Thérapeutique," art. "Chloroform."

‡ *Thèse d'Agregation.*

§ Charpentier, "Treatise on Obstetrics," vol. ii. p. 137. Wm. Wood & Co.

‖ Charpentier, *loc. cit.*

There is a great deal of testimony as to the utility of chloral hydrate in puerperal eclampsia. According to Testut's statistics, chloral has given better results even than anæsthetics.* So well satisfied is Charpentier with the chloral treatment, that after bleeding, he gives to it the preference over chloroform anæsthesia. He speaks favorably of its use as a prophylactic before confinement, when there is reason to apprehend convulsions, and during the attacks he would give large doses: "At first we give 60 grains to our patient; if this is not retained, or only partially, we give immediately a second, and, if necessary, a third dose, until the medicine is borne. Whether the attacks continue or cease, we do nothing for a few hours, say five or six, if necessary, and it is only at the end of this time that we give another 60 grains of chloral." In one case, Charpentier states that he gave as much as half an ounce in twenty-four hours. Where the chloral cannot be taken by mouth, it can be administered by enema (the yolk of an egg, three ounces of milk, one drachm of chloral, ten drops of laudanum). Charpentier does not regard disturbance of cardiac innervation and organic heart-trouble as contraindicating the administration of chloral in puerperal eclampsia. As for the *modus operandi* of chloral in this affection, it does good by the same action which renders it an invaluable hypnotic and antispasmodic; it stupefies the cerebro-spinal centres, and renders them insensible to the causes of the attack. The effects of chloral are not so speedy as those of chloroform, and they are more profound and prolonged; therefore, as a remedial agent, chloral is not so manageable. There are disadvantages attending its administration: the patient is not always in condition to swallow, even in the interval of the paroxysms, and will not always retain the chloral enema. Moreover, reliance on the rectal administration of this remedy presupposes a confined state of the bowels, and full purgation is certainly sometimes indicated. Therefore, I am persuaded that the voice of the profession will be more and more in favor of assigning to chloral a second place in the therapeutics of puerperal eclampsia,—*i.e.*, as an adjuvant to chloroform or ether.

Sometimes it is necessary in the treatment of this dire disease to strike a quick, strong blow, which will be felt at once over the entire economy, as when the violence of the convulsions threatens instant death. Here more will be gained by the prompt exhibition of chloroform than by waiting for the slower action of chloral, veratrum viride, or morphine.

I have nothing to say relative to the uses of bromide of potassium in puerperal eclampsia. In view of the uncertainty of action of this medicament, the immense doses required to produce spinal medullary sedation, its slowness of action, and the immense superiority of chloral, he would be an idiot who would resort to bromide as the principal or exclusive remedy.

Another and final indication is the elimination of the poison which, by exciting the motor centres, causes the convulsions. This indication, which is really primary (*indicatio causalis*), requires considerable time for its fulfilment, and during this time the patient may die from tetanus of the heart or respiratory muscles; hence it must be kept subordinate to the indication to calm the erethistic nerve-centres. When spinal excitability has been allayed by chloroform, then means may be taken to promote elimination. Bleeding has been regarded as depurative, but it is hard to understand how, by lessening the whole mass of blood, we can improve the quality of what remains. Purgatives seem sometimes to act favorably. It is always well, early in the treatment, to put a 10-grain calomel powder on the tongue. Afterwards, when the patient can swallow, a dose of Glauber salts may be given. I do not think that anything can be gained by resorting to elaterium; it is too drastic and depressant. The calomel, followed by Glauber salts, will produce several copious, watery stools, which will relieve the engorged kidneys, also clear the blood of urea and poisonous ptomaïnes.

Diaphoresis is frequently beneficial. Subcutaneous injections of ¼ of a grain of pilocarpine are followed by profuse sweating, and there is thus a considerable elimination of the *materies morbi*. According to Charpentier, in thirty-four cases where pilocarpine has been used for eclampsia, it acted well in twenty cases, two died; nine cases had such pulmonary complications that it had to be given up.

Charpentier, who has well collated the literature of the subject, concludes "that in dangerous cases pilocarpine ought not to be

* Thus, the revulsive treatment has given a mortality of fifty per cent.; blood-letting, thirty-five per cent.; purgative treatment, fifty-six per cent.; anæsthetic treatment, 17.8 per cent.; chloral alone, four per cent. (cited by Charpentier).

used exclusively. One of its advantages is to accelerate labor. Barker, on the contrary, who has used it in six cases, has seen bad results from it in every case, either in the heart or lungs, and does not believe that it should be used in eclampsia, and accepts it only as an adjuvant."*

Hot baths and wet-blanket packs have been used with favorable results by Liebermeister and Breus, while Jaquet and Polster have counselled wet-sheet packs to promote diaphoresis. Breus claims to have saved ten out of eleven cases by the hot-bath treatment. Other means, however, as the inhalation of chloroform and the administration of chloral, were also tried, so that it is hard to say how much credit was due to the baths.†

To sum up, the treatment of puerperal eclampsia includes the prophylactic treatment and the treatment of the convulsive seizures. Many pregnant women have albuminuria and nephritis, and go to their full term without convulsions. In these cases, the kidneys, though damaged, have never ceased duly to fulfil their *rôle* as blood depurators. In other cases, there are early warnings that there is danger ahead. Among the symptoms of renal insufficiency are headache, change of temper, drowsiness, ringings in the ears or photopsia, perhaps more or less dimness of vision, or blindness of one or both eyes, dizziness, dyspnœa, especially on exertion, nausea, and vomiting; the urine is scanty and loaded with albumen, while the percentage of urea is not more than one-half or one-fourth the normal. The patient may complain of involuntary twitchings and of general prostration.

Here the duty is plain. The patient must refrain from work, be put on a diet of milk, with or without Vichy water, and fruits, with a minimum of animal food. Saline diuretics, as cream of tartar or acetate of potassium, may be prescribed, and tincture ferri chloridi in full doses three times a day; a full dose of Glauber salts in the morning to promote free elimination by the bowels. It may even be expedient to give at bedtime a full dose of fluid extract of jaborandi to produce profuse sweating, or administer hypodermically 1/8 of a grain of pilocarpine, or even resort to the wet-pack or hot-bath. If, in spite of these efforts to relieve the engorged kidneys and protect the irritated nerve-centres, the patient becomes worse and convulsions seem imminent, premature labor should be induced by rupturing the membranes, or by the use of Barnes's water-bags.

When called to treat a woman already in the writhings of convulsions, if labor has not already commenced, it must be expedited by artificial means under chloroform. If labor has considerably advanced, and the os is dilated or dilatable, the patient must be immediately delivered by the forceps or by version. A 10-grain calomel powder may be placed on the patient's tongue, and if the vascular tension seems high, sixteen ounces of blood may be taken from the arm. It will be seldom desirable to repeat this venesection. Chloroform should be administered to complete anæsthesia, and the patient should be kept under its influence as long as convulsions threaten. As adjuvant to the chloroform, a full dose of chloral may be given by mouth or by rectum. Possibly in obstinate cases a full injection of morphine may be advisable.

I believe that this treatment will be more effectual and will save more patients than any other therapeutic method.

* Charpentier, *loc. cit.*, p. 136.

† THERAPEUTIC GAZETTE, 1888, p. 395.

THE HYPODERMIC USE OF MERCURIALS IN THE TREATMENT OF SYPHILIS.‡

BY L. WOLFF, M.D., PHILADELPHIA, PA.§

THE introduction of hypodermic medication by Alex. Wood, in 1857, was soon followed by various investigators and experimenters with mercurials, applied in a similar manner. Among them was Hebra, in 1860, who noted from injections of corrosive sublimate, dissolved in water, a rapid defloresence of specific eruptions in the neighborhood (?) of the puncture. Scarenzio, in 1864, injected calomel, suspended in mucilaginous fluids, and reported eight cases with highly satisfactory results. He was closely followed by Ambrosi, Ricord, and Montefork with like results, and their observations were confirmed by Berkley Hill in England and Bergh in Denmark.

Thus far the method was largely experimental, and not until Lewin, in Berlin, published the results of many cases successfully

‡ Read at the January meeting of the James Aitken Meigs Medical Society of Philadelphia.

§ Physician to the German Hospital of Philadelphia; Demonstrator of Chemistry, Jefferson Medical College, etc.

treated with injections of corrosive sublimate at the Charité Hospital in Berlin did the hypodermic medication with mercuric sublimate find more general recognition and application. He proved, while starting with $\frac{1}{12}$ to $\frac{1}{8}$ grain, that injections of even $\frac{1}{2}$ to 1 grain might be made without fatal or serious consequence. Citing the cases of one hundred and forty-four males and three hundred and fifty-six females, or a total of five hundred patients, he deduced that the total amount of the mercuric salt necessary to cause a complete disappearance of all symptoms to have been for males .17 gramme, or about three grains, while for females only .135 gramme, or a little over two grains, sufficed. Salivation was reported to have occurred in seventeen and a half per cent., and relapses were noted in only thirty-seven and a half per cent., against eighty-six per cent. of relapses by the other methods practised before that period at the Charité. Lewin concludes that the symptoms disappear in a ratio of rapidity with the amount of sublimate injected.

Lewin's observations were soon confirmed by those made at the clinics of Sigmund and Zeissl in Vienna, where the hypodermic injections of calomel were also further studied. Zeissl observed that .02 gramme, or $\frac{1}{3}$ grain, of the mild mercurial chloride, suspended in glycerin and water, and injected every day, brought about disappearance of the milder cutaneous syphilides within two to three days, and that, as a rule, a total of .3 gramme (five grains) to .5 gramme (seven and a half grains) of calomel administered in this way sufficed to abate all visible symptoms. He deduced that the greatest objection to this mode of treatment is the pain it gives rise to, both at the time of the injection as well as for some time afterwards, together with the formation of nodules in the connective tissue, which are both painful and last for some time, making exertions and physical labor almost impossible; this is more marked after calomel injections than after those with corrosive sublimate, though the former bring about more rapid disappearance of symptoms; ptyalism is not more frequent by this method than by the inunction treatment, and is less so with the sublimate than with calomel, and for that and other reasons he gives the corrosive sublimate the preference. A curious fact is cited that, while the gingivitis from inunctions affects the gums around the upper incisors principally, that of the hypodermic treatment with mercurials seems to affect those of the lower maxillary only. The pain and indurations produced by the subcutaneous injections of both sublimate and calomel soon led to the employment of compounds of mercury, which were to obviate these disadvantages. Arguing from the inference that the corrosive sublimate would be converted by the albuminous fluids of the cellular tissue into an insoluble mercuric albuminate, which, in turn, would be gradually dissolved by the excess of albumen and alkaline chlorides, both Staub and Bamberger were led to originate and employ a soluble albuminate of mercury, which *à priori* would appear a desideratum. However, the results with it were both unsatisfactory in regard to their curative results as well as to the painless administration of the mercurial, and were soon abandoned to give way to Bamberger's mercuric peptonate, which, while claimed to give less pain, appears not to give satisfactory results, as will be seen hereafter.

Other mercurials, such as the mercuric iodide, dissolved in potassium iodide, the mercuric cyanide, the mercuric formamidate, enjoyed an ephemeral popularity and reputation, but fell in disrepute when clinically tested and their results compared with those of calomel or corrosive sublimate. A combination of analgesics (morphine, cocaine) were admixed to their solutions, but rapidly crystallized therefrom as mercuric-alkaloidal-amides.

This brings us to the present decade, and with it a renewed interest in these methods. Though the work of Lewin had been early translated and published in this country, the new mode of treatment has never enjoyed a reputation in American practice, and while syphilographers gave it room in their treatises, they held aloof from committing themselves as to its results or recommending it to their followers. As much may be said of English practitioners, and the teutophobe French would hardly laud the good that came from Berlin. Thus, while Berlin and Vienna injected with excellent results, and piled up their statistics to many thousand cases, they stood alone in its praise. Liebreich in 1883 introduced the mercuric formamidate for hypodermic use, for which it is claimed that it rapidly exhibited its curative effect if injected in doses of from 10 to 20 minims of a one per cent. solution, that it does not often produce ptyalism, and gives rise to little or no pain (*Med. Times and Gazette*, January 6, 1883).

Delpech (*Thèse de Paris*, July, 1883) recommends the ammoniated mercurial peptonate for hypodermic use, which, he says, does not give rise to pain nor produce abscesses, etc. Its action, he claims, is most rapid, and readily reduces the severest lesions, without danger of salivation, in doses of 10 milligrammes (⅙ grain), while it obviates the gastro-intestinal irritation following the internal use of mercurials. Watrazenski, of Warsaw, in 1886 (*Centralblatt f. d. Med. Wissenschaften*), revived the injections of insoluble mercurials, and, after experimenting with calomel for some time, became dissatisfied with them, and proposed the mercuric, and also the mercurous oxides, suspended in water and mucilage, in doses of .06 to .1 gramme (1 to 1½ grains) repeated every six to eight days. Three to five injections like these suffice to bring the symptoms to abeyance. The oxides, according to him, cause little or no pain (?), nor do they produce abscesses, and he thinks the mercurous oxides the milder of the two in their action. Dr. Edward Lang (*Wiener Medizinische Wochenschrift*, Nos. 34 and 35) further introduces a new mercurial for hypodermic medication, which he terms "oleum cinereum," or gray oil. He prepares it in a manner similar to that in which mercurial ointment is made, but uses oils and fats instead of the more solid fats, and of a strength that each cubic centimetre of the twenty per cent. oil contains .23 gramme (four grains) of mercury. Of this he injects about $\frac{1}{10}$ cubic centimetre, and even $\frac{2}{10}$ to $\frac{3}{10}$ cubic centimetre once or twice a week, but often one injection every two weeks suffices, as larger quantities or more frequent repetition may cause ptyalism. He recommends these injections especially in adenitis, when the injections should be made near the glands, as well as in the periosteal gummata of the forehead, when the injections are to be made near their borders.

Kopp and Choten (*Vierteljahreschrift für Dermat. und Syph.*, 1886, 4, ii.) report two hundred and sixty-three cases which they had treated with satisfactory results at Neisser's clinic in Breslau, according to Scarenzio's method, with hypodermic injections of calomel. They made a total number of fifteen hundred and twenty-three injections, and observed among these seventy-two abscesses. They recommended the following formula as the best in their experience:

℞ Hydrarg. chlorid. mit. (vapore parat.), ℈iv;
Sodii chloridi, ℈i;
Aquæ destillatæ, f℥ii. M.

Of this, they claimed four injections, given in two sittings, two weeks apart, were sufficient to abate all symptoms; also that the sodium chloride present caused the formation of some mercuric chloride, thus preventing the formation of lower organisms. With proper cleanliness and the injections made in the gluteal region and the connective tissue thereof, they think its effect as sure, with a minimum of injections needed and cheapness of material, while occasional abscesses, uncertainty of dosage, and relapses are some of the disadvantages.

Dr. Balzer, at the Lourcine Hospital in Paris, experimented largely with the hypodermic injections of calomel, according to the method of Scarenzio and Smirnoff, by making a small number of injections deep into the muscular tissues. He introduced the employment of vaseline oil as excipient, instead of the usual water and glycerin. The formula employed by him is as follows:

℞ Hydrarg. chlorid. mit., .5 gramme (gr. viiss);
Olei vaselinæ, 10 grammes (℥iiss). M.

Dr. Besnier, at his clinics at the Hôpital St. Louis in Paris, approved of these methods as desirable modifications of the internal treatment by mercurials, which too often caused dyspepsia, stomatitis, etc., and often led to grave disappointments. He thought the calomel injections as of greater value than those with sublimate, on account of giving less pain (?) and requiring a smaller number of injections. He thinks the method of Scarenzio far superior, as the calomel is gradually changed into mercuric chloride, and .40 to .50 gramme (6 to 7½ grains) suffice for a cure (?). He notes the occasional occurrences of phlegmons and abscesses and the pain connected with it, but its revival is no doubt due to its manifest good effect. Balzer's employment of vaseline oil as a menstruum he considers a great improvement, but also urges strict sterilization of the calomel and rigid antiseptic precautions. He does not confine his patients to bed for three days, as recommended by others. Twenty-four to forty-eight hours after the injection the inflammatory reaction takes place, and a slight œdematous swelling about the injected calomel, a small nodule, painful to the touch, remains for eight days subsequently. With all due precautions abscesses were not avoided in some of the cases.

The question of hypodermic medication of syphilis with mercurials was the great

point of interest at this time (1887) in the hospitals and medical societies of Paris (Paris letters of the *Journal of Cutaneous and Genito-Urinary Diseases*). Du Castel, at the Hôpital du Midi, used .10 gramme (1½ grains) in vaseline oil for injections carried deep into the muscles of the buttocks at intervals of eight days. Phlegmons and painful nodules appeared at their sites. Martineau, at the Lourcine, still adhered to the ammoniated peptonate of mercury, of which he gives daily injections, and, as he claims, with excellent results, stating that he had made up to that time two hundred thousand injections in six hundred patients.

Dr. Besnier has since his earlier experiments totally renounced the calomel injections, first on account of the often unavoidable abscesses, and also the stomatitis and enterorrhœa occasionally following them. He thinks that only a minimum of the mercuric chloride formed from the calomel proves efficacious, and that the mercurialization, either by calomel or sublimate, is not more rapid than by other methods, and that relapses are as frequent as they are in the older ways of administering mercury. Dr. Maurice, as well as Dr. Hallopeau, have frequently noted abscesses after the use of calomel, as well as after the gray oil of Lang, and they confirmed the negative results of Dr. Besnier. Drs. Vidal and Fournier were also opposed to the injections of insoluble mercurials, as recommended by Scarenzio and Smirnoff on similar grounds.

In this country J. C. Wilson has recently treated syphilis and other manifestations according to these methods and with favorable results. It is only quite recently that Professor J. W. Runeberg, of Helsingfors, raises his voice to call attention to the dangers of mercurialization by injections of calomel (*Deutsche Med. Wochenschrift*, January 3, 1889) after Neumann, of Vienna, has pronounced against them as dangerous to health and life.

It is of interest in connection herewith to note the relative value of different mercurials used in the treatment of syphilis. At the Congress für Innere Medizin at Wiesbaden, 1887, Professor Kaposi led the discussion on the therapeutics for syphilis, and to the question propounded, "What are the respective advantages of the different remedies used in the treatment of syphilis?" the following arrangement by Bockhart as to the permanency of curative result was submitted and generally accepted:

1. Most permanent.
   - *a.* Inunctions with unguentum hydrargyri.
   - *b.* Calomel injections.
   - *c.* Lewin's sublimate injections.
2. Moderately permanent.
   - *a.* Sublimate chloride of sodium injections.
   - *b.* Albuminate and peptonate of mercury injections.
   - *c.* Blood serum mercury injections.
3. Less permanent.
   - *a.* Mercuric cyanide injections.
   - *b.* Glycocholate of mercury injections.
   - *c.* Mercury formamidate injections.

After this cursory review of the ups and downs of the hypodermic use of the various mercurials and some of the literature on the subject, I would venture as a deduction from my own experience with the hypodermic use of mercurials in the treatment of syphilis, that in my hands it has certainly produced many striking results. Under my preceptor, Dr. Julius Kaemmerer, I had, together with my friend, Dr. Rosenthal, an opportunity to practise injections of corrosive sublimate according to Lewin's method, perhaps among the first in this country. As early as 1876 and 1877 these injections were made by us daily, and in doses ranging from ⅛ to ½ grain at a time. In none of these cases, and ever since in many thousand injections of never less than ⅛ grain, frequently increased to ⅓ grain, have I been able to find abscesses resulting. In fact, with our present knowledge and ideas of suppuration I can hardly credit the development of pyogenic bacteria possible in a solution of mercuric chloride of the strength of 1 to 100.

Although I have used for some time for the injections a gold needle fitted to an ordinary hypodermic syringe encased in hard rubber, a steel needle well anointed will answer as well if properly cleaned and changed as often as corrosion will indicate this necessity. The solution employed by me contains 1 part of corrosive sublimate dissolved in 100 parts of distilled water, of which from twelve to twenty minims are injected daily deep under the skin into the connective tissue, in the region of the back, from above and below the scapula, down to the gluteal region, on both sides and on the sides of the chest. In no case were more than twenty-five to thirty injections made successively, and, as a rule, a total disappearance of the manifestations of early syphilis resulted after the tenth

injection. Even late secondary and beginning tertiary cases yielded readily even after other methods of treatment had failed. In all instances the doses were gradually increased until slight gingivitis was experienced, when the amount so injected was diminished until it had disappeared. Enteric or gastric disturbances were only experienced in exceptional cases and when very large doses were exhibited. All of the cases so treated were ambulant and attending to their occupations. Only a small percentage had relapses and had to undergo a second treatment, and only two a third one. An after-treatment with small doses of potassium iodide, 5 grains t. d., or, in place of this, Blanchard's pills of the iodide of iron, followed the injections, and were continued for three months or longer. This is done with a view to inhibit the rapid elimination of mercury following the hypodermic method of soluble mercurials. It is no longer a doubt that the iodides prevent or retard the elimination of mercury ("Ueber den Einfluss des Quecksilbers auf den Syphilitischen Process," by L. v. Vajda, Vienna, 1880), and the fact that the slower the elimination the greater the safety from relapses is now also generally accepted, and accounts for the permanency of the inunction treatment, after which the presence of mercury in the urine has been detected for a long period, and, in some instances, after thirteen years (Vajda, as above).

The injections of sublimate are painful for a short time afterwards, and leave for some days indurations in the subcutaneous cellular tissue, which occasion inconvenience and distress to the patient. The smaller doses do so in a very moderate degree only. The smallest quantity of sublimate used in a complete treatment by me was 3 grains, while in some of the more serious cases 6 to 8 grains had to be administered to that end.

The patients, as a rule, stand the treatment well, and but few desert on account of it. In order to avoid the pain arising from this method of treatment I have successively experimented with most of the various preparations enumerated above. The albuminate and peptonate of Bamberger I have found quite as painful and not as efficacious as the corrosive sublimate, while the calomel and yellow oxide of mercury injections, though, as by Balzer's directions, suspended in vaseline oil, proved less painful at the time of the injection, and were followed with inflammatory conditions of the connective tissue, which proved most distressing to the patient. The calomel injections, in my hands, even with the utmost precautions, were often followed by abscesses. The mercuric oxide is in this and its curative effect much preferable, but the pain it gives rise to and the inflammatory indurations are in no respect less, if not more, than with the former. Much might be said and speculated upon the conversion of the mercurials in the tissues, but after all the corrosive sublimate seems to have the most direct bearing upon the pathological cause of syphilis.

When we take into consideration the rapidity with which it causes the symptoms to disappear, when the small amount of mercury introduced into the system is duly considered, and the relative results obtained by it alongside of other, and especially the internal, methods of administering mercurials, it seems surprising that the hypodermic injections of mercurials have taken such slight hold among us.

There is no doubt that the more rapidly the early symptoms of syphilis are brought to abeyance, the greater the immunity from later and more central lesions. I hold, therefore, that next to, and perhaps even before, the unclean and unprecise inunction method, hypodermic injections of corrosive sublimate are by far the best means to reduce the symptoms, and, I believe, cure syphilis in its early stages. That they are painful there can be no question, but if by them and with the endurance of some pain (which is by no means unbearable) we can accomplish in one month what years of ingestion of mercurials often fail to do, and avoid besides the almost certain impairment of the digestive functions, and prevent later and more central lesions, I think my claim is not overdrawn when I consider the treatment of syphilis by the hypodermic use of mercurials, and especially corrosive sublimate, as the most precise, safe, rapid, and sure of all those heretofore employed.

333 South Twelfth Street.

COCAINE IN LABOR.

By A. L. Wagner, M.D., South Bend, Ind.

PERHAPS I may be treading already well-known and mapped grounds, but I have been unable to find any mention in the current literature of the use of cocaine in parturition. I have used it in all my cases

since 1885, especially in those cases where I was called in early, and I have used it also in those cases where called late, if there were any reasons to believe that labor would be prolonged.

Reasoning that the pain of labor comes from three sources, and seeing in cocaine a means of annulling one of them, I began its use. The three sources of which I speak are as follows,—the greatest given first: dilatation of the cervix, vagina, and outlet; the dragging and intolerable pain of an unruptured and tough membrane, and the pressure of the uterine muscular fibres on the uterine nerves during a contraction of the uterus.

In those cases where the membranes are prematurely ruptured, or where the os is unnaturally rigid, the pain from dilatation of the cervix is unusually severe and labor is abnormally prolonged. In these cases, as well as in normal labors, cocaine not only annuls the pain, but it also permits or causes a more ready dilatation by paralyzing the circular fibres of the os. My experience has been that, instead of waiting from four to twenty-four hours, by the use of cocaine the labors have been about two hours long,—*i.e.*, from the time of sufficient dilatation of the os to admit the finger, to full dilatation and expulsion of the fœtus. After full dilatation of os but few pains are required to expel the fœtus.

It not only shortens labor, but it annuls the pain to such an extent that the patient, if in sharp pain, soon manifests her freedom from it by remarking that the labor is not progressing as it should, because she feels the pains to be less energetic. This is the only way that the primipara is conscious of the help she has obtained from the use of the drug, but in the multipara after the birth the realization of an easy confinement is apparent, and she is correspondingly grateful to her physician.

In the following case the lady was in her first confinement. I was called at 10 A.M., and found that she had been having light pains, and she wanted to know when she would be confined. I found the os large enough to admit the finger,—*i.e.*, the finger entered the os easily and impinged upon the vertex, and was touched on all sides by the cervical canal,—and told her that it would be some time before labor would terminate. I then went to my office and procured some cocaine suppositories, and called on another parturient, and then returned at eleven, and used a suppository of 2½ grains. By the time I returned pains were somewhat stronger, and, after cocaine was used, she said her pains had almost stopped; but the os had dilated a great deal, and I applied another suppository at 12.10. At 12.45 the os was fully dilated, and she was complaining of a *continuous dragging pain in the back that did not disappear between pains.* This, I aver, is the true index to the time for the artificial rupture of the membranes, regardless of the engagement of the vertex in the brim, or the relative size of the os, or the descent of the child and membranes into the vagina. I therefore ruptured the membranes at this time, and the babe was born the second pain, at 1.3 P.M., making the labor about two and a half hours long.

CASE II.—*June* 6, 1887.—I was called to see Mrs. B., who had been in hard labor since the previous night at 7 P.M. She was attended by a midwife, and, as there seemed to be no progress, the husband desired the attendance of a physician. I found the os about the size of a quarter silver piece, hard and unyielding, the rest of the parturient canal in a very poor condition for childbirth. I used the suppository at 12.30, and in fifteen minutes she said the pains had ceased almost entirely, but at one o'clock the os was twice the size it was at first and much softer. By encouraging her to bear down voluntarily, which she said was useless, as the pains were not as strong as at eight the previous night, the waters broke at 1.30, and then I made use of a hypodermic injection of cocaine into the perineum, or rather on each side near the perineum, and used another suppository. In one-half hour the child was born, with the exclamation from the mother, "Oh, Lord! is it born so soon?" The position of the vertex was the occipito-posterior. Here the anæsthetic annulled the pain, and caused the os and the rest of the canal to dilate, whether from paralysis of sphincter muscular fibre, which Bell says does not exist in the cervix, or from relieving reflex tonic spasm by annulling pain and irritation.

CASE III. was one from which I apprehended much trouble, as she was a very close-built woman, and had been suffering for many months from pyosalpinx, which would fill up and discharge regularly every two months. Besides this, she had been suffering since the first month of pregnancy from angina pectoris, and I feared that the expulsive pains while in childbirth would augment arterial tension, as she had grown gradually worse as pregnancy advanced, and that the angina would

prove fatal, as I had seen several like cases recently recorded. She had had four other children, and said she usually labored from forty-eight to seventy-two hours in terrible pain, hence my misgivings. The second month of pregnancy the left tube emptied itself through the uterus, and I had much trouble in preventing an abortion. And at each successive month till the eighth the os would dilate, pain and hemorrhage would come on, and an abortion would seem imminent, but was gradually overcome. The tube on the left side was enormously distended by the time labor came on, and I was absolutely certain, if labor lasted for any such length of time as she assured me the previous ones had, her chances for suppurative peritonitis and death, from ruptured tube, was very great. On the morning of February 25, at seven o'clock, I was called, and I found that she had had some few transient pains, but the os was not at all dilated, and I gave a small dose of morphine and returned to my office. At 2 P.M. I was again called, and found that the pains had dilated the os to the size of a five-cent nickel. This at 2.30. I then introduced a three-grain suppository, and soon she was complaining of her heart instead of labor-pains. A hypodermic of $\frac{1}{75}$ grain of glonoin relieved her of her anginal pain, and she then began to accuse me of postponing her labor, as the pains were nearly gone.* But in the mean time the head was advancing well, and at four I used another suppository. At 4.50 she had a more severe pain, and the waters broke. At 5.2 the child was born without any help from the mother, except in three or four contractions. The babe was born and cried before she knew it had come, and the lady's mother, whom I told to hand me the tape, asked me what I wanted with it, and would not believe that the child was born till I showed it to her. About the tenth day the tube emptied itself, and the heart-trouble had made but one slight appearance.

In almost all of my cases I have used cocaine, from 2 to 3½ grains, and about one to one and a half hours apart, never using more than two on the same case. After birth I use the regulation antiseptic douche to clear the vagina of the cocaine that may remain. I never have seen any unpleasant results from its use. I have always used it in those cases where the child was presenting a shoulder or arm, and the parturient is placed in the genu pectoral position for relief, with, I think, good results.

102 SOUTH MICHIGAN STREET.

* In the previous threatened abortions I had used opium and viburnum to no purpose, and finally tried the fluid extract of horse-chestnut. With this, I firmly believe, and so did the lady, that we had postponed the labor about twenty-one days. The time of impregnation was limited to coitus indulged in two separate times, about ten days apart, and isolated by three months from any previous or subsequent indulgences.

NOTES ON HOANG-NAN.

BY JOHN V. SHOEMAKER, A.M., M.D.,
PHILADELPHIA, PA.

HOANG-NAN, or hwang-nao, tropical bindweed, is an exogenous plant, native to the mountainous districts of Laos, Anam, and Tonquin. It belongs to the natural order Loganiaceæ, and has been given the botanical title of *Strychnos Gautheriana*, in honor of the Roman Catholic missionary, M. Gauthier, who, in 1874, brought it to the notice of the civilized world. It grows with slender stem, without support, until it reaches the branches of tall trees, around which it twines. Its stem is gray, and its leaves are of a dark-green color. It is found only in spots, and is said to be not very abundant. Its active ingredients, according to the examination of M. Wurtz, are the alkaloids strychnine and brucine, the latter being present in the larger proportion. We have received it in the powdered form, from which a fluid extract and a tincture have been prepared. The natives believe that the bark is most efficacious when protected from the light. Nature accomplishes this purpose by clothing it with a reddish moss. The dose of the fluid extract is from 5 to 30 drops thrice daily, freely diluted with water, and it is best given before meals. It is rapidly absorbed by the stomach. Its elimination I have not particularly studied, but it presumably escapes from the system chiefly by the kidneys and bowels. Its action, I infer, is assisted by the same agents, which act synergistically with nux vomica,—*i.e.*, belladonna, ergot, and electricity. On the other hand, conium, opium, and tobacco should be antagonistic. Physiological antidotes to its toxic results are chloral, bromide of potassium, ether, and chloroform.

I have studied its physiological action upon frogs, rabbits, and dogs. Upon all, in adequate doses, it soon produced severe clonic spasms, which presently assumed a tetanic

character. 30 minims of the fluid extract injected into the jugular of a dog caused general clonic and tetanic spasms, and a rapid and considerable fall of the blood-pressure, beginning twenty seconds after injection. Death occurred in five minutes. The movements of respiration ceased in two minutes, three minutes before failure of the heart's action. 10 minims thrown into the jugular gave rise to general tetanoid convulsions. The arterial pressure began to fall in ten seconds, and continued gradually to sink during the space of a minute. As with the larger dose, respiration was more profoundly affected than the circulation. 5 minims failed to produce convulsions. A slight and temporary decline in the rate of the pulse and the arterial pressure took place directly after the injection, but was succeeded by a slight rise. The temperature was unaffected in rabbits, but was not noted in the dogs. In rabbits the bowels were relaxed, and some blood appeared with the evacuations. No effect was perceived upon the action of the kidneys or of the skin. Clinically, upon the human subject, administered in medicinal doses, I have noticed that hoang-nan has an alterative effect upon the sebaceous glandular system, stimulating their activity if repressed, or restraining it if excessive, at the same time improving the quality of the secretion. It exerts, also, a corrective influence upon the functions of the perspiratory glands.

It is as a general tonic that hoang nan will find its widest sphere of usefulness. It invigorates the nervous system, and through it the muscular and glandular apparatus, and strengthens the action of the heart. Owing to its chemical composition its remedial effects are very similar to those of nux vomica. It may be appropriately used in the treatment of chronic alcoholism, in order to increase the appetite and digestion, to relieve the tremor and prostration which follow a debauch. In small doses it will allay the nausea due to the same cause, and sustain the heart upon the withdrawal of alcoholic drink from a system long habituated to its use. It may be used in anæmia, in conjunction with iron. It will also frequently prove useful in cases of amenorrhœa. Administered in the intervals between attacks of spasmodic asthma it is calculated to diminish their frequency and severity by improving the innervation of the muscular coat of the bronchioles. It is worthy of trial in tobacco amaurosis. It will probably prove efficacious in the treatment of chorea. It is of value in the treatment of dyspepsia, since it improves the appetite, dispels flatulence, relieves nausea, and promotes the action of the bowels. In small doses I should expect it, like nux vomica, to be a valuable agent in the vomiting of pregnancy. It would be proper, also, to make trial of its effects in idiopathic epilepsy. In its native country it is highly esteemed in the treatment of fevers. It is not unlikely that it may be advantageously employed as a substitute for or an addendum to cinchona, just as the wood and the root of nux vomica are used in the East Indies in cases of malarial fever, and the bark of strychnos pseudo-quina in Brazil as a substitute for cinchona. It is a good tonic in convalescence from typhoid fever. I have employed it in erysipelas without perceiving any marked curative result. It is indicated in all the varieties of neuralgia. In hemiplegia, after the clot has been absorbed, hoang-nan may be given in order to stimulate the motor nerves and the nutrition of the disabled muscles, and in post-paralytic tremor it is likely to prove an excellent remedial agent. It is also applicable to cases of Bell's palsy, to rheumatic, diphtheritic or lead paralysis, and to reflex paraplegia. The natives of Anam and neighboring countries prize it highly as a cure for leprosy. We are not without favorable testimony from European physicians practising in regions where this disease prevails, but I apprehend that, although it may sometimes cause absorption of tubercles in the earlier stage, yet it will be found destitute of any specific curative effect. Whatever good results follow its administration in lepra will rather be due, I think, to its promoting general nutrition. I observed very carefully one case of lepra in which I employed this remedy persistently during three months. The general condition of the patient improved, but I was unable to detect any influence whatever upon the tubercles. It is also of great repute in the East as a remedy against rabies and the bite of venomous serpents. In fact, it was the native reputation of hoang-nan in these last two affections and in leprosy that led M. Gauthier to bring it to the notice of French physicians. I have had no experience with it in hydrophobia or snake-bite, but, judging from what I have observed of its properties, I do not conceive that it will be found to have a specific value. The same virtues have been vainly attributed in the north of India to another species,—the *Strychnos colubrina*. It is a useful drug in neurasthenia, and hence will

prove of service to the gynæcologist and genito-urinary specialist.

I have given hoang-nan with very good results in cases of seborrhœa, particularly of the scalp, in which situation it not infrequently leads to loss of the hair and premature baldness. In alopecia, also, its effects are good, benefiting the growth and health of the hair through its influence upon the circulation and secretions of the skin. In hyperidrosis it is capable of checking the morbid excess of perspiration. In pustular eczema I have witnessed marked improvement from the use of the drug under consideration. This appeared to be especially the case when the disease attacked those parts of the body which are the most plentifully supplied with sebaceous glands, as the face, neck, back, and genitalia. I have derived very good results from hoang-nan in cases of acne. In sycosis, also, its administration has been followed by gratifying improvement. The same remark applies to furuncles and carbuncle, in which it moderates the intensity of the inflammation, and sustains strength and the digestive powers. In scrofulous manifestations it has a marked beneficial effect. Tumified glands diminish in size, and amelioration takes place in cutaneous affections dependent upon the strumous taint. In old cases of syphilis, attended by great general debility, it is often more judicious to suspend the so-called specific medication, and rely, for a time, upon constructive remedies. Ulcerated tubercles and gummata, and the visceral involvements due to syphilis, aggravated by unhygienic surroundings, and by sexual and alcoholic dissipation, not infrequently do better for a time under simple constitutional tonics than an antisyphilitic course. Hoang-nan has been vaunted as a remedy in malignant new formations. This praise, however, I am unable to endorse. It may temporarily serve a good purpose in preserving the appetite and digestion, but I have never seen any indication of its staying the progress of the malady.

To sum up: Hoang-nan has failed to approve itself as a powerful remedy in leprosy, rabies, snake-bite, or cancer, and in fevers it possesses no special efficacy. But it has a wide range of applicability as a roborant. An exhausted state of the nervous system, flaccidity of the muscles, torpor of glandular organs, are remedied by the suitable exhibition of this drug. In medicinal doses it may be maintained for a long while, indefinitely, in fact, with none but the best results.

POSITION AFTER DELIVERY AS A CAUSE OF UTERINE DISPLACEMENTS.

By E. T. Campbell, M.D., Tabor, Iowa.

Is not the custom of requiring a woman, after delivery, to lie on her back the conventional nine or ten days, a frequent cause of uterine displacements?

This is a question which has presented itself to me for some time. I do not recall having seen anything bearing on this subject, and therefore bring it up that possibly some discussion may be called forth.*

Most uterine displacements date from a fall or jar communicated to the pelvis; some from unusual physical exertion at the time of the menstrual flow. Why should the latter prove a cause only at this time? Simply this. The uterus at this time, to fulfil its function, requires and receives an increased blood-supply, and becomes enlarged and congested; the force of gravity is greater, and this, combined with the action of the abdominal muscles, overcomes the resistance of the ligaments, and they give way. More especially is this true in women of relaxed and flabby tissues.

After labor the uterus is enlarged, and, in addition, the round and broad ligaments have been upon the stretch for several months in accommodating themselves to the pregnant uterus, and hence, after the rapid expulsion of the child and consequent reduction in size of the now empty uterus, have not had time to again accommodate themselves to this second change, and are thus incompetent to serve their function.

The supports of the uterus now are slack, and, as the woman lies upon her back, the uterus, being temporarily deprived of its support, from force of gravity falls back upon the sacrum; and as she remains so for ten days, the round ligaments accommodate themselves to this position, and, when the woman gets up, the force of gravity on the contents of the abdomen crowds the fundus still lower into the pelvis, and from now on she is a sufferer from the many ills caused by a retroversion.

True, as in other instances of the disobedience of nature's laws, the more robust escape the punishment which nature has decreed, but the more frail must suffer the punishment.

* Since writing this note my attention has been called to an editorial article on this subject in the Therapeutic Gazette for August, 1889, page 532.

Now, would it not be better, in the after-treatment of puerperal women, to require them to change their position from time to time, and even take the knee-elbow and knee-chest position, say, after the third day, night and morning, in order that the ligaments may have an equal advantage to retract and take in the slack, as it were, as the uterus undergoes subinvolution?

This would prevent the uterus from assuming and retaining any malposition until the ligaments are in a condition to perform their function.

I am convinced that the requiring of a woman to lie upon her back until the round ligaments will no longer do their duty is a gross error, and, if corrected, will deprive the many gynæcologists of the majority of their practice and lessen the necessity for Alexander's operation.

A CASE OF MANIA TRANSITORIA.

By J. M. Bell, M.D., Murphy, Cherokee Co., N. C.

IN the *University Medical Magazine*, vol. i., No. 1, in the article "Thoughts concerning the Symptomatology of Insanity" the author uses the following language: "The drift of modern science is to show that there is in the brain a more or less complete differentiation of function, and it is most probable that one set of nerve-cells is connected with emotion and another set with intellectual thought, so that the excitation of one set of cells produces an explosion of nerve-force, taking the form which we know as anger, and the excitation of another set of cells causes a paroxysm of fear or love, while the result of the action of still another set of cells is the development of ideas. If an influence so affects the intellectual cells of the brain to-day as to pervert their function, intellectual insanity results. To-morrow, the same influence transferred to the emotional cells, may cause an emotional insanity."

These remarks recall to my mind a very strange case which occurred in my practice some years ago. John Williams, a farmer, and an upright and respected citizen, aged about 45, had been troubled for some time with chronic diarrhœa, and was quite thin. In the middle of a very hot day in July he walked out into his field, as he was in the habit of doing, to see his hands at work. About midnight following he called up his wife and a young man, who was visiting him, told them he was going to die, and requested the young man to write his will. Page after page was dictated, written, and read to him, the man appearing as rational as usual. As morning approached he became threatening and very talkative. I visited him about noon, and found him lying on his back, with his legs drawn up, and swaying to and fro from side to side. He kept his arms revolving around each other, and was talking so rapidly and incessantly as to froth at the mouth. He seemed to be perfectly conscious, recognizing and speaking to every visitor, of whom there were some twenty-five or thirty of his neighbors, changing, without halting, his language and address with every new-comer.

The strange feature of the case was, that although he talked so rapidly and unceasingly, using language wholly original, slanderous, and entirely devoid of truth, his sentences were short and in rhymes. Occasionally he would sing, using the same language, short sentences, and rhymes. His language was similar to this:

> Good-morning, Dr. Jones,
> You look like a stack of bones;
> God told you I was sick,
> And sent you here quick;
> He said if I didn't get well,
> He'd send me down to h—ll!

He scarcely ever missed a rhyme, and when he did he seemed not to know it, and never faltered. Such had been his condition since the early morning, and in this condition he continued for over eighteen hours. Under the influence of large and repeated doses of opium, he gradually became less voluble, and by next morning talked more slowly. The succeeding night he slept a little, and continued to improve, and in a week was as well as usual, but remembered nothing that he had said.

Upon questioning his wife and acquaintances, I was told that he had no regard for poetry, was never known to try to make rhymes, or even to make an effort to sing, nor was he in the habit of using bad language.

I am no believer in phrenology, but do not see how to account for his *ex tempore* poetical and musical success unless there be some part of the brain presiding over this faculty, which, in his case, was under a high degree of stimulation. Was not the case of blind Tom, the idiot but musical prodigy, a similar one, except that Tom's musical faculty was abnormally but permanently developed at the expense of all other faculties?

NOTES ON A CASE ILLUSTRATING THE DURATION OF THE CONTAGION IN SCARLET FEVER.

By H. C. Wood, M.D., Philadelphia, Pa.

IT is a question of such practical importance to determine how late the poison remains in the human system after an attack of acute exanthematous disease, and how long it is possible for an ex-patient to give the disorder, that we put upon record the following case, which occurred in the family of a well-known physician, and the details of which can, therefore, be absolutely relied upon.

One child was taken sick on Friday, April 19, 1889, with sore throat, followed the same evening by the eruption of scarlatina. The same night the child was isolated, and the other children of the family were sent entirely away from the city house. The case ran the ordinary course of a mild attack of scarlet fever, and the children were kept apart till June 1,—*i.e.*, forty-two days after the first outbreak. On June 15, two weeks after the meeting of the children in an isolated country house, a second child was seized with scarlatina. This second child had not been in the original house, the seat of infection, since removal, but had slept with his brother the night of June 1. There had, also, been no intercourse between the family at home and the children between the dates mentioned. The clothes of the first child had all been destroyed, and there seems to be no possible explanation for the second child being attacked excepting on the theory that the fever originated *de novo* in the country at a place where there was no scarlet fever, or else that the first child imparted it to the second forty-two days after the commencement of the disease. It should also be stated that the first child had been repeatedly bathed during convalescence.

NITROGLYCERIN IN THE TREATMENT OF ARTERIO-SCLEROSIS.

In a recent work on the diseases of the heart and blood-vessels, Dr. H. Huchard lays stress upon the importance of modifications in arterial tension as a cause and a symptom of disease. Contrary to what is generally believed, Dr. Huchard claims that the increased arterial tension, which is always met with at the outset of arterial sclerosis, whether generalized or localized, is the cause and not the effect of this affection, since it precedes, instead of following, direct pathological change. As a consequence, it is evident that the indication is to combat this exaggerated blood-pressure by drugs which will reduce blood-pressure, and which will cause dilatation of the arteries. Among these may be mentioned the nitrites, nitroglycerin, and the iodides, and, perhaps, also, as suggested by Liegeois, veratrum viride. In addition, the diet should be regulated principally in restricting nitrogeneous foods, and should be largely confined to vegetable matters.

As regards nitroglycerin, Dr. Huchard, in the *Revue Générale de Clinique et de Thérapeutique* for August 8, 1889, writes that the danger of nitroglycerin producing methæmoglobin has been greatly exaggerated, and Dr. Huchard claims that methæmoglobin never appears in the urine of animals poisoned by nitroglycerin. Dr. Huchard further alludes in this connection to the paper of Dr. Ferreira on the uses of nitroglycerin in cardiac and renal arterio-sclerosis. His memoir is based upon seven cases, all of which were highly benefited by the use of nitroglycerin. Dr. Huchard further believes that nitroglycerin may be regarded as a substitute for the iodides, and possesses the advantage over the iodides in that, while the latter reduces arterial tension, they likewise depress the nutrition of the vascular walls, while nitroglycerin depresses blood-pressure without affecting the walls of the blood-vessels.

Dr. Huchard states that the daily dose of 20 drops of one per cent. alcoholic solution of nitroglycerin should never be exceeded. Even this dose is ordinarily too much; even 10 to 20 drops may produce severe supra-orbital headache. Ordinarily, not more than 2 or 3 drops should be given at one dose, while the average dose, when the drug is administered for several months at a time, should be from 6 to 8 drops daily. In the treatment of angina pectoris, aortitis, dilatation of the arteries, interstitial nephritis, etc., Dr. Huchard's custom is to give the iodides for twenty days in each month, and nitroglycerin in the ten remaining days. In cases where a rapid effect is desired, such, for example, as severe attacks of angina pectoris, Dr. Huchard has recourse to hypodermic injections of nitroglycerin; or, when it is desired to augment the vaso-dilator properties of the iodides, nitroglycerin may be combined with them. Further, Dr. Huchard claims that the iodides may actually cure arterial sclerosis, and prevent angina pectoris, when given in doses of from 45 to 60 grains daily for three or four years, taking care to suspend its use for eight to ten days each month.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

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Leading Articles.

SWITZERLAND AS A HEALTH RESORT.

THERE are in these United States, as well as in other civilized countries, hundreds of men, free from disease, or, it may be, even in robust health, who, at the end of winter's work, find themselves nervously exhausted from the strain of unremitting labor, and with muscles soft and fat-laden, or, at least, with tissues and emunctories clogged up, because, from indolence or sheer lack of time or power after a successive day's labor, they have neglected exercise, and who needs must look about them for some way or place to renew their wasted energies. For such as these, after much experience, we are convinced that the wilderness—either the Rocky Mountains, or the canoe wilderness of Maine, or other "North Woods"—offers the best possible opportunities, provided that the individual has such love of nature or such contempt for the soft things of modern civilization as not to mind the rough fare, hard beds of ground or bough, multitudinous assaults of insects, and the various other annoyances which certainly do abound in that northern region, which, notwithstanding these drawbacks, often seems to be nigh to the gates of Paradise when August's sunshine glimmers over lake and forest, or November's pencil touches the hard-wood trees with celestial glories.

Man, however, likes variety, and the most enthusiastic woodman may well spend some summers elsewhere than in his favorite haunts. Moreover, there are many by whom good meals, comfortable beds, and secure smoke-free protection from rain and storm are thought to be essential. For such as these to-day we sing the praises of Switzerland. A trite theme it may be thought, but, in fact, one which in truth is not so trite as in the seeming.

Hundreds of Americans haunt Switzerland, but very few seem able to understand it,—to get out the sweetness and the glory there is in it, and to bring themselves into such intimate contact with its mountains and valleys, that, like Antæus, from mother earth they shall draw renewed strength for life's conflicts. The great tourist tide flows in rapid current through the hotels of Geneva, Lucerne, and Interlaken, sends off a few streamlets of carriages to Grindelwald and Lauterbrunnen, mayhap a solitary horseman to Zermatt, or even over the Grimsel, and returns to the shores of America, its individual units each happy in the delusion that Switzerland has been achieved, few, if any, of them distinctly renovated, unless it be the women, for, to many American women, even to roll along a Swiss mountain boulevard in soft cushions seems to be exercise compared with the physical quietude of home.

The first contention of this editorial is, that such seeing of Switzerland as is typically American is not much better than Mark Twain's plan of climbing mountains or viewing the world by proxy: that for men a *foot tour;* for women, either a foot tour or a *horseback tour* is the only proper way of using Switzerland as a health resort, or of getting close enough to it to appreciate its beauty and grandeur.

The famous "Oertelischen Kur" has, as every one knows, exercise by mountain-climbing as its basis. Our Swiss cure is little more than this Oertelischen cure, made interesting and æsthetic, on the one hand, and, on the other, stripped of its dietary restrictions, which are, after all, only required in the severest cases, and which can in a measure be carried out even in a general walking tour such as we are speaking of. Innumerable gouty individuals receive yearly relief by the enforced hygiene and

the depurative waters of the various European spas. Not a few of them, we believe, would get more permanent benefit in Switzerland, where exercise would not only remove effete material and depurate the system, but build up new tissue, so that renewed strength, and not merely tissue purity, would be achieved. It must be, however, always borne in mind that the desired goal can only be reached by hard, continuous work,—work severe enough to cause free, persistent sweating, and continued for hours in succession until it produces tired, aching limbs, and, at least in the beginning, almost physical exhaustion.

The second and chief object of the editorial is to show how this cure can be carried out in sufficient detail, for any one, by means of a Baedeker, to reach at once the outgrowth of knowledge usually acquired at considerable expense in money and time.

The cost of a walking tour through Switzerland varies with the taste and self-indulgence of the walker. It is, however, not necessary to spend more than two dollars and a half a day, even if wine of the cheaper sort be freely used and first-class hotels patronized. Three dollars a day is a sufficient allowance for any but the most extravagant individuals; while to one who speaks some German and is very careful, it is possible to get through easily on two dollars a day, and we have known Americans accomplish it on less. It is one of the advantages of Switzerland that the smallest, second-class, wayside inn has clean, comfortable beds, sweet bread and butter, and meats which are usually tender, although they may be confined to trout and the flesh of the kid. At least this is true of the Bernese Oberland. In Catholic Switzerland, the Valley of the Rhine, and south of it, we have seen sour bread in the largest hotels.

Our estimate of cost is based upon the supposition that no riding of any kind is indulged in and no guides employed. If the folly of high mountain-climbing be entered upon, the expense may readily mount up to fifty or more dollars in some difficult ascents, where several guides and porters are required.

When time is plentiful, much expense may be saved by making a few days stay at a place, using it as a basis for excursions, provided that at arrival a bargain is struck with the landlord to keep the party *en pension*,—that is, at a fixed rate per day without any extra charges. The minimum period of stay for which this arrangement can be made for a single individual is usually five days, but when there are several persons in the party, very few Swiss landlords or landladies will refuse a three days' *pension*, if the terrors of departure of the party are skilfully dangled before them.

The postal service of Switzerland is so organized that, at an almost nominal expense, baggage, even great trunks, can be sent from place to place with certainty as to time of arrival. Therefore the walker should have a double outfit,—one very scant, which he carries with him, and one which he sends by mail, and uses as a sort of portable storehouse to draw upon.

Only essentials should be carried in the knapsack, and, according to our thinking, these are a waterproof coat, night-shirt, soap, tooth-brush, pocket-comb, and heavy underwear, to be put on in the evening after the wash, which ought to follow the day's exercise. Changes of underclothing, of course, should be in the valise.

It is essential that the shoes be sufficiently large to allow a felt sole to be put inside of them, and that the leather sole be at least three-quarters of an inch thick and well hob-nailed. Unexperienced tourists are apt to have the hob-nails driven into an ordinary sole, with the almost inevitable result of sore feet from the pressure of the nail-head through the sole.

Each European spa has its regulation period for a cure, and the Swiss mountain-cure should not be less honored. It differs, however, from that of the spa in that it cannot be so prolonged as to do injury, so that it is the minimum length that we speak of. This we would fix at four weeks, although a more permanent effect can undoubtedly be obtained by a six weeks' stay, and, if four weeks cannot be afforded, much can be gained by an industrious use of three weeks. The tour which is indicated in the following paragraphs can be readily gone over in three weeks, or prolonged to five, according to the stay made at certain indicated points, and, if the pedestrian has unoccupied time still left, he can add a walk over one of the passes into the Italian Alps and among the lakes of that far-famed district.

It should be further added, that the present tour is so laid out as not only to include almost everything in Switzerland, except the Engadine and Eggishorn, and, perhaps, Righi and the Pilatus, worthy of visit, but also that it is possible for ladies to accompany upon horseback the walkers.

Of all the larger cities of Switzerland, the only one which has preserved its mediæval characteristics sufficiently to interest greatly the traveller is Berne. To appreciate its charms, however, it is essential not to go with the common crowd of tourists into the large hotels in the newer parts of the town, but to haunt one of the old houses built some hundreds of years since by bishop or guild, and now used as hostelries frequented by Swiss, German, and other knowing persons.

Of these old guild-houses we can especially recommend the Hotel Fancon, or the smaller Pension Herter, the latter being the more unpretending, but cheaper and scarcely less inviting.

We will now suppose that from Paris our tourist reaches Berne; thence by well-travelled routes he proceeds to Goeschenen, at the mouth of the St. Gothard tunnel, and begins his pedestrian labors by an hour's walking through the wonderful Goeschenen defile over the Devil's Bridge to Andermatt. This village is worthy of a stay of three days, the first day being devoted to a walk over the Oberalp Pass to Chiamut (seven miles), or even to Sedrun (fourteen miles) and back; the second day to an excursion to the summit of the St. Gothard Pass; the third to loafing. From Andermatt the valise should be sent to Grindelwald or Lauterbrunnen.

Leaving Andermatt, the first day may take the tourist to the top of the Furca Pass; the second over the summit of the Furcahorn (to be omitted if time is short) to the Rhone Glacier Hotel. From this by a five-hours' walk he reaches the top of the Grimsel Pass, and an afternoon's rest. From Grimsel his feet carry him to Meiringen; from Meiringen it is a very hard day's work over the Great or Hasli Scheidegg to Grindelwald. The Valley of the Rosenlau, through which the path leads, is most beautiful, and most pedestrians will, we think, consult pleasure as well as comfort by spending a night on this route, either at the large hotel of the baths of Rosenlain or the Pension zum Schwartzwaldgletscher, more conveniently situated higher up the mountain. If the traveller be not pressed for time, instead of proceeding at once from this resting-place, he may make the ascent of the Faulhorn, which is very highly spoken of, and will afford another day of honest work. Indeed, the Rosenlau hotel may well be used as the centre of excursions for several days.

Grindelwald is worthy of a three days' stay, so that its glaciers may be studied and weary limbs be recuperated, or the traveller may at once press on over the Wengernalp to Lauterbrunnen, taking his midday meal at the Hotel Jungfrau, with the Jungfrau Mountain rising in eternal, dazzling whiteness immediately before him.

Two days are essential for Lauterbrunnen. The first day to enjoy the beauties of the place and to visit the Falls of Trümmelbach (one and a half hours' walk each way), to us the most extraordinary in Switzerland. The second day should be given to an excursion to Mürren and the Fall of the Schmadribach, and here the hotels of Mürren offer themselves most invitingly for a day's rest.

From Lauterbrunnen it is a short walk to Interlaken; thence by railroad direct to Spiez; or preferably to Thun, as this city is well worthy a short visit, and it is a beautiful ride in the boat from it across the lake to Spiez. From Spiez it is a day's walk to Kandersteg, and here may we venture to commend the Bär Hotel, with its most gushing of landlords. A day or two may be well spent here, especially in an excursion to the Œschinen Thal. Then, by a hard day's walk over the Gemmi Pass, Leuk Station is reached. If time do not press, this course may very well be broken at Leuk Bad, and a half day given to a visit to the Cliff Ladders.

From Leuk the railroad carries one in a couple of hours to Visp; thence is a good day's walk by Stalden through the beautiful Saas Thal to Saas Fèe, a place not frequented by Americans, but one of the most beautiful in Switzerland, and one, from its great elevation (about six thousand feet), into which European hay-fever patients retreat with a security of relief. Three or more days may be spent in excursions from this point, especially should Mattmark and the summit of the Moro Pass be visited.

From Saas Fèe, with guides, one of the high passes may be crossed to Zermatt, or the less ambitious pedestrian can reach that place by a hard day's work spent in retracing his steps to Stalden, and going thence by St. Nicholas and Zermatt. Three days at least are required for the more simple excursions from Zermatt, especially to the Gorner Grat, which affords probably the finest view that can be reached in Switzerland without perilous climbing. Zermatt, as well as Saas Fèe, is a great centre for high mountain-climbing, and may readily be made the basis for a month's enjoyment of this dangerous pastime.

Returning from Zermatt to Visp, the railroad takes the tourist to Martigny; thence, by an eight- or nine-hours' walk over the Tête Noire, he reaches Chamonix. Here, after some days of excursion, our pedestrian can go by diligence to Geneva, or walk over the Col-de Balme (ten hours) to Martigny, and thence by rail. If time allow, from Martigny it is very easy to reach the Eggishorn; but for details of this route the reader is referred to guide-books, as the four or six weeks' Switzerland cure may well be considered as ending at the second visit to Martigny.

At least two days are required for Lauterbrunnen. The first should be devoted to the place itself and to a visit to the Falls.

SOME NEW RESEARCHES ON HYOSCINE.

IN spite of the length of time during which hyoscine has been before the profession, its position does not yet seem to be well established. In looking through the numerous communications which have appeared on this subject, one is struck at the great discordance of the results, not only as to its activity as a hypnotic and the danger of producing poisoning, but especially as to the variation of the size of the dose employed. Consequently, no conclusions can be drawn from such observation other than that the difference in the results attributed to hyoscine is due to the fact that different authors have employed different drugs. This position is strengthened by a paper published by Drs. Malfilate and Lemoine in the *Gazette Médicale de Paris* for September 7, 1889, in which they state that the results which they have recently obtained from the administration of hyoscine differed in many respects from those which followed their earlier studies on this subject. The authors, therefore, believe that the hyoscine at present on the market is more pure, or, at any rate, subject to less variation in its composition, than that which was furnished a year ago.

With the object of studying the hypnotic value of hyoscine, these authors have administered the hydrochlorate of hyoscine in hypodermic injections to sixty-two patients, employing in all three hundred and sixteen different injections. In fifty-six instances the patients were affected with mania, the majority suffering from insomnia. Many of these were refractory to morphine and chloral, associated with bromides and hyoscyamine. Thirty-eight of these cases, or sixty-seven per cent., under the influence of an injection of $\frac{1}{210}$ of a grain, slept for five or six hours, or sometimes even longer. Of thirty eight patients who had been favorably influenced by the first dose, in nearly all the results obtained by these injections continued during two weeks without any increase of the dose; in others the effect became less and less marked, until, after successive increase of the quantity given, the dose finally, in two cases amounted to $\frac{1}{40}$ of a grain; and, although with this dose the effects were well marked, the sleep produced was of a shorter duration than followed the original injection of $\frac{1}{210}$ of a grain. In other cases the dose was rapidly increased to as much as $\frac{1}{60}$ of a grain. Although the authors have never exceeded doses of $\frac{1}{40}$ of a grain, they believe that if larger quantities were given, sleep would not be produced, but symptoms of poisoning would appear. In a certain number of cases, in addition to the hypnotic effect, there was considerable reduction of the degree of excitement, an effect which lasted from twenty-four to forty hours, and in some cases was present for three weeks after the suppression of the use of hyoscine. In other cases, on the other hand, the hypnotic effect was always preceded by more or less marked agitation, which especially took the direction of a destructive tendency. In eighteen cases no hypnotic effect followed a dose of $\frac{1}{210}$ of a grain, and, in fact, the patient's condition seemed to be made worse by its administration. In twelve others five were put to sleep with a dose of $\frac{1}{112}$ of a grain, four with $\frac{1}{60}$ of a grain, and three with $\frac{1}{64}$ of a grain. In these latter cases the hypnotic effect was maintained without any notable increase in the dose. Of the sixty-two patients treated with hyoscine, with the object of producing sleep, in nine cases of general paralysis and cerebral syphilis $\frac{1}{112}$ of a grain produced sleep lasting from four to seven hours in five. A patient suffering from general pseudo-alcoholic paralysis was, in fact, refractory to a dose of $\frac{1}{120}$ of a grain, while 30 grains of chloral caused him to sleep thirty-six hours. The authors have further noticed that dilatation of the pupil was usually wanting, and even when it was present it always disappeared by the next day. In patients capable of detailing their feelings, there were noted trouble in accommodation, diplopia, and a certain degree of paresis of the limbs. In a case of melancholia and tuberculosis no effect

was produced by $\frac{1}{125}$ of a grain, while $\frac{1}{64}$ of a grain produced ocular disturbance.

The authors state that they have never noticed the dryness of the throat and diminution of the salivary secretion so frequently noted by other observers. In fact, two cases complained of excessive salivation. Headache or illusions were not complained of in any instances, and even when injections were made previous to or immediately after eating, there was no disturbance of digestion. The authors, likewise, believe that very minute doses have a certain amount of stimulating effect, and have been employed with this object in view in cases of melancholia and hypochondria, with marked improvement of the patient's condition. In this connection we may mention that, according to the Paris correspondent of the *British Medical Journal* for September 28, 1889, M. Magnan, who has lately tested hydrochlorate of hyoscine in his wards, finds that a dose of $\frac{1}{64}$ of a grain in five minutes renders the patient calm; he appears as if slightly intoxicated by alcohol, his feet seem rooted to the ground, he ceases talking. This drug is valuable in the treatment of insanity; under its influence lunatics become calm, and this condition is not transitory. In delirium tremens it induces healthy sleep. A child of 13, suffering from tic, under its influence was cured of the spasmodic movements. A hysterical patient, suffering from profuse perspiration of the hands and arms, was entirely relieved by means of an injection of $\frac{1}{120}$ of a grain; the perspiration was arrested in two minutes.

On the other hand, Drs. Coleman and Taylor (*Lancet*, October 12, 1889) appear to have obtained the most satisfactory results from the use of what appears to us to be excessively large doses of hyoscine. Nine cases of excessive mental excitement are reported in which doses varying from $\frac{1}{100}$ to $\frac{1}{60}$ of a grain of hyoscine were administered subcutaneously, and in no one of these instances is there any note of any disastrous effect being produced. While, on the other hand, two cases are reported in which a dose of $\frac{1}{125}$ of a grain produced excessive dryness of the mouth, dimness of sight, and delirium, without having any effect on the muscular system of spastic paraplegia due to myelitis, in the other case, a dose of $\frac{1}{65}$ of a grain was without influence on epilepsy, but produced great restlessness, as well as dilatation of the pupil, and paralysis of accommodation. These cases illustrate the remark made at the commencement of this article as to the unreliability of the different preparations being the most probable explanation of the discrepancy of results attained by different observers through the use of this drug.

In his inaugural dissertation presented to the medical faculty of Strasburg, Dr. August Schleussner reports eighteen cases of various forms of insanity in which hyoscine was used as a hypnotic. Five hundred and seventeen separate injections were employed; of these, in four hundred and seventeen the result was stated to be extremely satisfactory, in seventy-three moderately successful, and in twenty-seven no action was noted, thus giving a percentage of successful cases of 80.7 per cent., 14.1 per cent. of moderate successes, and 5.2 per cent. of failures. Experiments with chloral showed a satisfactory result in sixty-seven and a half per cent., moderately successful in twelve and a half per cent., complete failure in twenty per cent. With paraldehyde the results showed seventy-five per cent. of success and twenty-five per cent. of failure. Dr. Schleussner's tables further show that doses of $\frac{1}{120}$ of a grain are usually unreliable. In fourteen cases in which this dose was employed, in five cases a satisfactory sleep was obtained, in six the sleep was disturbed, and in three no influence was produced. With gradually increasing doses the action was somewhat better; with $\frac{1}{100}$ of a grain in sixty-nine cases, in fifty-six the result was satisfactory, in eleven moderate, and in two without effect. In the employment of $\frac{1}{125}$ of a grain in two hundred and seventy-seven cases, the effects were good in two hundred and forty-four, in twenty-five there was moderate success, and in eight there was failure. With a dose of $\frac{1}{100}$ of a grain in fifty-six cases, the effects were good in forty-one, moderate in thirteen, and a failure in two. With $\frac{1}{60}$ of a grain in thirty-eight cases, the effects were good in twenty-nine, moderate in eight, and there was failure in one. With $\frac{1}{80}$ of a grain in thirty cases, effects were good in twenty-six, moderate in three, and without success in one. With $\frac{1}{70}$ of a grain, out of sixteen cases there were nine successes, two moderately successful, and in four it was without action, while, finally, in doses of $\frac{1}{64}$ of a grain, in fourteen cases there were seven successes, two moderately successful, and five failures. It, therefore, seems that moderate doses of about $\frac{1}{100}$ of a grain are most reliable, and only when these doses fail to give sleep should the amount given be increased. The author found that usually

the hypnotic effect of hyoscine was evident in fifteen minutes or half an hour after the injection, while the sleep produced is quiet, deep, and lasts ordinarily from five to seven hours. No effect on the respiration was noted. The pulse was sometimes slightly accelerated, at other times even somewhat slow. Most of the patients complained that the injections were somewhat painful, but in no case was an abscess produced. In employing it through the mouth somewhat larger doses are required than when given subcutaneously, but in general the results were found to be the same. No disturbance of digestion was noted or any unpleasant after-effects.

The author confirms the general opinion as to the value of this remedy, stating that it is a hypnotic of the highest worth, and that it will seldom fail to produce sleep in cases of insomnia; while on account of the moderate-sized doses required, and the fact that no ordinary dose had produced any bad after-effect, and that it is free from disagreeable taste and odor, and that it may be used either subcutaneously or by the mouth, are additional recommendations for the use of this hypnotic.

Finally, some experiments with hyoscine, prepared by Ladenburg, have been undertaken by Messrs. Magnan and Lefort (*Practitioner*, September, 1889). They find that in doses of $\frac{1}{60}$ of a grain it produces excellent results in acute mania in five minutes after ingestion. The patient loses his morbid activity and grows silent, then mydriasis and loss of power of accommodation follow, and the patient goes to sleep for five or six hours without further inconvenience. It has also been used successfully in delirium tremens and in severe local spasms in a child. In view, however, of the facts pointed out by Dr. Mitchell Bruce (*Practitioner*, xxxvii. p. 321), that doses of $\frac{1}{100}$ of a grain may produce symptoms of failure of the heart and Cheyne-Stokes breathing, it may be mentioned that M. Laborde finds that doses of one-tenth the quantity used by Messrs. Magnan and Lefort are sufficient for the purpose.

CHLORALAMIDE IN CHOREA.

IN addition to its value as a hypnotic, which now seems to be tolerably well established, chloralamide is claimed to be an almost invaluable specific in the treatment of chorea, though, it must be admitted, that this claim is based upon as yet insufficient premises. Nevertheless, the cases reported by Dr. Alt (*Wiener Medizinische Blätter*, September 12, 1889) certainly are very striking. The first of these was that of a boy, 11 years of age, who, after five days' treatment with 15 grains of chloralamide, administered three times daily, was almost absolutely cured of a severe case of chorea. This was also the case with a girl who had been unsuccessfully treated for fourteen weeks with arsenic. She was cured, likewise, after eight days' use of chloralamide. Dr. Alt, also, confirms the almost unanimous testimony as to the value of chloralamide as a hypnotic, especially in cases of simple insomnia, where sleep is produced without any influence upon the circulation, respiration, or digestion, and with but insignificant after-effects.

In the *Pharmaceutical Journal and Transactions* for September 27, 1889, Mr. R. Caswell Harrison adds the following notes as to the pharmacology of chloralamide. He states that, while the solubility is stated to be 1 in 9 parts of water, that he has failed to dissolve 20 grains in 240 fluid-grains of water, the actual solubility being about 1 in 14

On heating in a dry test-tube, it melts, and gives a strong smell of chloral, which condenses on the sides of the tube; and on further heating, chars, and gives a peculiar smell, recalling HCN and onions. Heated with solution of potash, it gives off a smell of chloroform and ammonia. H_2SO_4, HNO_3, HC_1, and Fe_2C_{16}, respectively, have no apparent action in the cold. On adding a few grains to a mixture of half an ounce of strong sulphuric acid and four drops of ninety per cent. carbolic acid, and warming, the mixture boils almost immediately, and quickly changes to a bright red color, with a strong chloral odor. This test will distinguish it from most of the new synthetical products, if applied as above, the reactions being shown by the following table:

Antipyrin.	Antifebrin.	Chloralamide.	Phenacetin.	Sulphonal.
No effect.	No effect.	Bright red color, with chloral odor.	Dask purplish brown, with strong acetous odor.	Bright emerald green, immediately changing to dark dirty green, with strong sulphurous odor.

Chloralamide does not reduce Fehling's solution or decolorize Pavy's.

THE PHYSIOLOGICAL ACTION OF EXALGINE.

IN the *Bulletin Général de Thérapeutique*, September 15, 1889, Dr. Gaudineau publishes an elaborate essay on the physiological, chemical, and therapeutical properties of methylacetanilide, or exalgine, the new hypnotic recently described in several numbers of the THERAPEUTIC GAZETTE. The author formulates his conclusions as to the physiological action of exalgine as follows:

First.—As exalgine is an aromatic derivative, it has no marked toxic properties, and is capable of influencing the sensory and motor nervous systems, and of affecting the respiratory and circulatory organs. In poisonous doses, like other poisons of its class, its principal action is on the red blood-corpuscle, diminishing the energy of gaseous interchange into the blood.

Second.—Exalgine produces death in doses of 7 grains for every two pounds of body weight of the animal.

Third.—In lethal doses, convulsions are produced, and death is rapidly produced by asphyxia.

Fourth.—In poisonous but not fatal doses of 3 grains for every two pounds of body weight, the temperature is reduced rapidly for several successive hours.

Fifth.—In a healthy man, doses of from 4 to 6 grains produced no effect beyond slight vertigo and ringing in the ears.

Sixth.—The primary action of exalgine is on sensibility; its action on thermo-genesis is secondary.

As to the clinical application of exalgine, Dr. Gaudineau formulates his conclusions as follows:

First.—Exalgine, given in doses of from 3 to 6 grains, if the subject is non-febrile, is ordinarily without effect.

Second.—Doses of 4 to 6 or 12 grains modify considerably the pain experienced by a patient suffering from neuralgia or any painful affection.

Third.—Exalgine is poisonous when administered in doses equivalent to 7 grains for every two pounds of body weight, so that in ordinary therapeutic doses it may be stated to be absolutely inoffensive, and that this new remedy is less dangerous than aconitine, digitaline, and all the alkaloids frequently given to patients.

Fourth.—The therapeutic dose varies from 4 to 12 grains administered in the twenty-four hours.

Fifth.—In these doses exalgine has never produced any other trouble other than slight vertigo and ringing in the ears.

Sixth.—Exalgine is especially valuable, from the fact that it does not irritate the stomach, and that the doses required are small.

The analgesic effects of exalgine are especially evident in the treatment of neuralgia, and, to a less reliable degree, in the treatment of pains of a rheumatic character. Finally, while exalgine is but little soluble in cold water, it readily dissolves in solutions containing diluted alcohol, though it is easier to administer in powder or in some solution flavored with some aromatic.

THE DIURETIC ACTION OF THE CHIMAPHILA UMBELLATA.

DR. ABET publishes in the *Bulletin Général de Thérapeutique* for July 30, 1889, a comprehensive study of the botanical, chemical, and pharmacological properties of the *Chimaphila umbellata*. This plant belongs to the family of the Ericaceæ, and, according to the analysis of Fairbank, made in 1860, its leaves contain gum, starch, sugar, tannic acid, resin, fatty matters, chlorophyl, cellulose, and a yellowish, crystalline matter, which he called *chimaphiline*. This principle was obtained by treating an alcoholic tincture with chloroform. It is insoluble in water, soluble in alcohol, ether, and chloroform, fixed and volatile oils. It has a neutral reaction. Beshore also obtained the crystalline principle by boiling in petroleum ether. The crystals melt at 236°. They are soluble in ninety per cent. alcohol, ether, benzol, and chloroform, and form compounds with bromine. The substance is insipid and inodorous. Dr. Abet has apparently been unable to add anything to this imperfect analysis. He, however, states that the diuretic principle he believes must be of a nature somewhat similar to arbutin, but as yet he has failed in extracting it. He has experimented with a number of different preparations of this plant, and abandoned them all except the soft alcoholic watery extract, this preparation being free from the disagreeable taste and irritating properties of the other preparations. He states that he has employed this alcoholic extract, in doses of from 120 to 225 grains, given dissolved in water, with a little rum and orange syrup. He has experimented on eleven cases of heart-disease where there was

reduction in the amount of urine, where there was dyspnœa, and more or less œdema.

He states that in all these cases there was marked increase in the activity of the kidneys from the second day of treatment, and that this condition was maintained until there was complete disappearance of the œdema. The drug is stated, however, to have no action upon the heart; therefore, if Dr. Abet's statements are correct, it must be regarded as a renal diuretic.

ELIMINATION OF SALICYLIC ACID BY THE KIDNEYS.

THE danger attending the use of many drugs, even when taken in small doses, in cases of renal affections, has led Dr. Chopin to investigate the conditions governing the elimination of salicylic acid by the kidneys, both in the healthy and diseased state (*Journal de Médecine et de Chirurgie Pratiques* for August, 1889). It would appear, from the author's results, that in all cases where there is a renal lesion the economy retains the medicine considerably longer than in the normal state, and it seems that salicylic acid, which, when the kidneys are normal, increases the quantity of urine, in acute nephritis, on the other hand, diminishes it. So, when moderate-sized doses are given in cases of kidney-affection, the well-known symptoms of intolerance of salicylic acid appear in the first or second day of its administration, for the reduction in the amount of urine retards elimination, and so leads to the accumulation of the drug.

These results have an especial importance in indicating the wisdom of prohibiting the use of salicylic acid as a preservative of foods, for even when given in the smallest amounts, when the kidneys are affected, toxic symptoms supervene. In France it is stated that more than one hundred thousand pounds of salicylic acid were used in 1880 for the preservation of foods, and the facts given above certainly justify the conclusion of the French Academy in prohibiting the use of this article for the purpose of preserving foods.

SUBCUTANEOUS EMPLOYMENT OF ANTIPYRIN.

DR. L. BACH has made two hundred and seven injections of antipyrin in one hundred different cases of various diseases, principally of a neuralgic character, calling for a remedy which would relieve pain, and has published his conclusions in his graduation thesis at the University of Würzburg, 1889.

Of these cases, there were cured twenty cases of muscular pain, nineteen cases of neuralgia, and eighteen cases of articular pain, making in all forty-seven. Fourteen cases of muscular pain, ten cases of neuralgia, and two cases of pain in the articulations, making in all twenty-six, are stated to have received temporary relief. No result whatever was noted in eleven cases of muscular pain, four of neuralgia, and one of articular pain. These cases may be again subdivided into the following groups: Nine cases of sciatica were cured, one case unaffected; five cases of lumbago were cured, one was uninfluenced; two cases of hemicrania were cured, three obtained temporary relief; three cases of trigeminal neuralgia were cured, three obtained temporary relief, and one was uninfluenced; seven cases of articular rheumatism were cured, two obtained temporary relief, and one was unaffected. The author further states that in twenty-six cases the patients complained that the injection was extremely painful, in thirty-two cases they stated that there was slight pain produced, and forty-two cases testified to entire freedom from pain. Finally, the author classifies his conclusions as follows:

1. Subcutaneous injections of antipyrin, as regards the production of local pain, is of the most varied action, the result evidently depending upon the individual disposition of the patient.

2. No difference between the first and subsequent injections can be made out.

3. Whenever possible, the injection should be made into the tissue of the muscles, since in this locality it is, at any rate, no more painful than in the subcutaneous tissue, and infiltration is avoided.

4. Previous injections of cocaine are to be recommended.

5. As recommended by Liebreich at the last Wiesbaden Congress, the injection should be made as near as possible to the seat of pain. An apparent exception to this rule is found in the fact that in hemicrania and orbital neuralgia relief will frequently follow with astonishing rapidity the use of injections into the deltoid muscle.

6. There is no probability of antipyrin ever being regarded as a substitute for morphine.

7. Injections of antipyrin arrest pain in hemicrania and in muscular pain, especially in lumbago and neuralgia of the sciatic and

trigeminal nerves. In most cases the relief is permanent; in others it lasts from six to eight hours.

8. In articular rheumatism it seems to be almost a specific, as, in the single case in which it failed to give relief, failure can be regarded as attributable to the complications existing in the case.

9. No difference is evident as regards its influence upon acute or chronic pain; it appears to act equally well in both cases.

10. The five cases in which chills, cold sweat, palpitation of the heart, and symptoms of syncope followed its use show that its employment should be carefully watched, although in no cases were the symptoms severe enough to cause any anxiety. Since in none of these cases was cocaine injected with the antipyrin, the results are attributable to the latter alone.

11. Only in the rarest instances will these injections fail to produce some improvement.

In most cases the author employed a solution of antipyrin made in boiling distilled water. In other cases he employed a solution consisting of one hundred and fifty grains each of antipyrin and water in which three grains of cocaine were dissolved, the latter solution being ordinarily less painful in its employment.

It is to be regretted that the author has not in any case given more accurate statements as to the dose which he employed, other than saying that he employed a syringeful of these solutions.

Reports on Therapeutic Progress.

THE THERAPEUTIC VALUE OF OXYGEN INHALATION.

At a recent meeting of the New York Academy of Medicine, DR. W. GILMAN THOMPSON read a paper on the therapeutic value of oxygen inhalation, with exhibition of animals under high pressure of oxygen (*Boston Medical and Surgical Journal*, July 25, 1889). He said that he had been impressed by the fact that while some observers claimed the most brilliant therapeutical results from the use of this agent, others held that it was of but little, if any, practical value, and still others used it in such a vague way that no reliance could be placed upon the results obtained. As was well known, the ordinary pressure of the atmosphere was fifteen pounds to the square inch: of this amount three pounds was exerted by the oxygen and twelve pounds by the nitrogen. The first question that arose was, Does an increased pressure really cause more oxygen to be absorbed? Under any circumstances the hæmoglobin of the blood could take up but two and a half per cent. more of oxygen, and it was also a fact that it could not enter the plasma to any extent.

In most of the older text-books it was stated that animals could not live in pure oxygen, the system being burned up, as it were, by the increased tissue-changes excited by it. This idea, however, was an entire mistake, as was conclusively demonstrated by Dr. Andrew H. Smith in the series of experiments made by him in 1869 and 1870. Having referred to some of the symptoms produced in the human subject by the inhalation of oxygen, he said that very little additional oxygen could be made to enter the system by any amount of pressure short of that which would result in injurious effects.

He then exhibited the apparatus which he had had constructed for the purpose of exposing animals to high pressures of oxygen. It consisted of a strong iron drum, or chamber, with glass-covered openings at each end, in which the animal to be experimented upon was to be placed; and to this oxygen was supplied at any degree of pressure desired, from a cylinder containing the gas at a pressure of two hundred and twenty-five pounds to the square inch. Two animals, a monkey and a pigeon, which had been subjected for one hour to a pressure of thirty pounds to the square inch, in oxygen, in addition to the ordinary pressure of the atmosphere, fifteen pounds, were taken from the chamber in an apparently perfectly normal condition.

Dr. Thompson next proceeded to make a detailed report of a number of experiments he had made upon animals which were in a normal condition at the time the experiments were commenced, the animals being dogs, cats, pigs, monkeys, guinea-pigs, pigeons, and alligators. It was found that all the animals could exist comfortably in the oxygen until a pressure exceeding three atmospheres was reached. The higher the order of the animal experimented upon the more quickly it became affected. As a rule, a decided fall of temperature, often amounting to from 4° to 6° F., was observed; and only in cold-blooded animals was there any rise of temperature. This marked decrease in temperature he did not believe was to be attributed at all to the

effects of the oxygen, but to the profound disturbances caused in the system by the high pressure employed. If, as was claimed by the older writers, a greatly increased tissue metamorphosis was caused by oxygen, this would unquestionably be accompanied by an increase, and not a diminution, of the body temperature. In a paper read before the Royal Academy of Madrid, Valenzuela reported similar results. In animals subjected to oxygen in a pneumatic chamber under increased pressure he found that the temperature was reduced several degrees, and rabbits in which septicæmia had been artificially produced had the temperature reduced to normal.

In such of the animals as died as a result of subjection to high pressure of oxygen, or were killed after removal from such exposure to high pressure, Dr. Thompson found pulmonary engorgement and dilatation of the right heart. The convulsions which usually resulted when the pressure was carried to a high point were, as a rule, quickly controlled by blowing off five pounds of pressure. He also tried the experiment of subjecting animals on alternate days to high pressure of oxygen and to compressed air, the series of observations being maintained for a considerable period. The cause of the convulsions produced by exposure to high pressure of oxygen, he said, was as yet undecided, but he was inclined to attribute it to the difference in the diffusion of oxygen and carbon dioxide under different degrees of pressure.

A second series of experiments was performed upon animals in which abnormal respiration had been induced. Dyspnœa might be classified as being due—

1. To abnormal conditions of the air.
2. To abnormal conditions of the blood.
3. To obstructed circulation.
4. To diminished surface for aëration.
5. To neurotic influences.

In a cat in which dyspnœa was produced by cutting both vagi instant relief was afforded by exposing the animal to oxygen; while, on the other hand, the dyspnœa was increased by compressed air.

In the second experiment a canula was introduced into the pleura of a dog. In the third, pulmonary congestion was caused in a cat by injecting a solution of nitrate of silver into the lung-tissue, and the dyspnœa resulting therefrom was greatly relieved by oxygen. In other experiments the lung was compressed by injecting considerable quantities of water into the pleura, and in still others the animals were bled to the extent of many ounces. The results of these experiments, he said, went to show that oxygen does aid in a moderate degree certain types of dyspnœa.

In considering the therapeutic value of oxygen it was to be borne in mind that it was a physical impossibility to take oxygen into the blood. This agent had been employed, first, as a curative in certain general diseases, more particularly of the blood and circulation; and, second, as a palliative in dyspnœa due to various conditions. Of late its use had increased to such an extent that two or three hundred thousand gallons of it were now consumed annually in New York City alone. Among the affections, besides dyspnœa, in which it was claimed that it had proved of benefit, were anæmia, chlorosis, croup, chronic gastric catarrh, migraine, cholera, and opium narcosis. It was used more generally in this country and on the continent of Europe than in England, and in Paris a supply was kept on hand at the stations along the Seine for use in resuscitating persons rescued from the river, and also at some of the police and fire stations.

In anæmic, chlorosis, etc., Dr. Thompson said he could see but little advantage over good fresh air in giving diluted inhalations of oxygen two or three times a day, as was the usual practice in such affections. It did not seem rational to him to expect that sufficient oxygen could enter the system under these circumstances to produce anything but a temporary effect at the best. In cases of blood-poisoning, again, he had failed to see any benefit derived from oxygen. In certain subjective cases of dyspnœa it no doubt gave relief, but in a case of poisoning by illuminating gas, which he had seen at the Presbyterian Hospital, it was kept up for nearly three days without producing any effect either on the rate of breathing or on the cyanosis present. In cardiac diseases his experience with oxygen had not been encouraging, and he referred particularly to a case of malignant endocarditis in which it proved of no avail in relieving the dyspnœa. In certain cases of asthma and of anæmic dyspnœa, however, it gave decided relief, and in such he believed it was an invaluable therapeutic agent, though not, of course, curative.

In the discussion which followed, Dr. J. West Roosevelt spoke of the relation of the amount of oxygen inhaled to that absorbed, and said that, while the amount which entered the plasma or the hæmoglobin of the blood was comparatively small, he believed it

was sufficient to cause appreciable results in many instances. As to the therapeutic value of oxygen, in the neurotic form of dyspnœa we had a condition in which the mere act of inhalation and the engaging of the attention of the patient would often have a beneficial effect. In anæmia he had met with fairly good results with oxygen, though the patients improved less rapidly than under the use of iron. If in any case the hæmoglobin was not saturated, an improvement showed that more oxygen was carried than under ordinary circumstances. On the whole, oxygen had proved of considerable value in his experience, and in cases of diminished surface for aëration he had seen cyanosis decidedly improved under its use.

Dr. George L. Peabody said that so many circumstances were involved in estimating the value of an agent like oxygen that it was difficult to arrive at positive conclusions respecting it. Thus, when it was not the only therapeutic agent employed, it was impossible to say just how much benefit was derived from it; and this difficulty was further increased in diseases which naturally tend to recovery. The question of the utility of oxygen he believed was still undecided. When the idea of its administration first occupied the profession it was the practice to give internally chemical substances, like chlorate of potassium, for instance, which were known to be rich in oxygen. It was far from certain, however, whether they yielded up their oxygen on entering the body; and even if this were so, it seemed probable that the resulting compounds might have a more or less caustic effect upon the tissues. This was apparently the case with osmic acid.

Later it had become the practice to give oxygen by inhalation. Under such circumstances its absorption depended probably on the amount of hæmoglobin in the blood at the time the oxygen was administered; but in any event the amount absorbed was unquestionably small. There was good reason to doubt the alleged efficiency of this agent, and personally he believed that, as a rule, quite as much relief could be obtained from ordinary fresh air. It might be tried, however, in maladies attended with dyspnœa, in which the blood is unchanged, such as pneumonia, emphysema, croup, and asphyxia from toxic gases; although, as Dr. Thompson had correctly stated, in poisoning from illuminating gas it had failed to give relief. There was no justification, he thought, for the extensive use of oxygen in general diseases, such as anæmia, chlorosis, lithæmia, etc. Although the pulmonary gymnastics of the inhalations might have a beneficial effect in certain instances, there were other remedies which could be employed with much greater advantage. That the use of oxygen hastened recovery in such cases he did not believe, and the recognized facts of physiology were certainly at variance with any such conclusion.

Dr. Beverly Robinson said that he differed entirely from Dr. Peabody, and that his clinical experience afforded the most conclusive proof of the immediate and marked relief resulting in many conditions from the use of pure oxygen. In anæmia he had found that those cases were most improved in which oxygen was used in connection with iron. The purity of the gas was a point of the utmost importance, and he said that one make of gas which he had formerly employed gave such poor results that he ceased to use it. There was a gas now manufactured in New York which was said to contain a certain proportion of nitrogen monoxide, from which he had obtained very satisfactory results; and it was worthy of note that Brown-Séquard had expressed the opinion that nitrogen was of great service in preventing the irritating and intensely exciting effects of oxygen alone.

In albuminuria connected with atrophic nephritis he had found the general nutrition of the patient notably improved under the use of oxygen; the digestive and assimilative powers being greatly assisted by it. Even in phthisis, while it did not have a curative effect, it might prove beneficial. In the first place, the inhalations caused the patient to thoroughly expand his lungs; secondly, oxygen was itself an antiseptic, and therefore indicated; and, thirdly, it had the effect of improving the general nutrition. As had been well said, oxygen was really prescribed every time that a patient was sent to the mountains, to Southern California, to the plains, or on a sea-voyage. But there were many cases in which it was impossible to send patients away, and he believed it was possible to stimulate the hæmoglobin in the blood, and thus to enable the patient who remained at home to carry more oxygen. In the use of oxygen he did not think we should be guided so much by experimental researches as by practical clinical experience. Without considering the curative effects of the remedy, there were certainly many cases where the

last hours of patients could be rendered much more comfortable by resorting to its use.

Dr. Walter Mendelson said that he felt compelled to agree with Dr. Peabody from what he had observed of the effects of oxygen. In anæmia it was true that he had seen some quite marked results under its use; but he did not believe that the benefit was in reality due to this agent. He cited the case of an old man who inhaled ten gallons of oxygen a day, and became greatly improved. This improvement, however, he was convinced was due to the systematic expansion of the lungs and to the moral effect of the knowledge that something out of the common was being done for him. In cases of dyspnœa from various causes he had seen more or less relief afforded by oxygen; yet all the patients died. Still, as Dr. Robinson had said, it was possible that their last moments were rendered more comfortable by the inhalations.

Dr. Mary Putnam Jacobi said that the amount of oxygen which the hæmoglobin carries varied under different circumstances. In asphyxia of various kinds the physiological capacity of the blood remained the same, and therefore the indication was to administer oxygen. The correctness of this had also been shown by clinical experience. In anæmia, and especially chloro-anæmia, on the other hand, the hæmoglobin was diminished. The condition was precisely the reverse from that met with in asphyxia, and we could not cause a much greater amount of oxygen to be absorbed.

Dr. Andrew H. Smith said he was gratified to find that the work which he did twenty years ago for the most part still remained good. At that time he had demonstrated that animals could live perfectly well for four days in pure oxygen, care being taken to remove the effete products of respiration. It was his opinion that under ordinary conditions the blood is not fully saturated with oxygen, and that the point of saturation corresponds with the physical demand. This allowed a pretty wide margin, and it was, perhaps, within this margin that a considerable amount of oxygen could be absorbed by the blood. Thus, the demand for oxygen was much greater in athletes engaged in violent exercise than in individuals making but little physical exertion. Therapeutically, he had seen the greatest benefit derived from oxygen in catarrhal conditions of the air-passages, such as was met with in suffocative bronchitis. In such cases he was at a loss how to explain the relief afforded by the oxygen, unless it was a fact that under these conditions the blood did not take up as much oxygen as the system required. When pneumonia was present so many conditions were brought into play that the matter was much more complex and the relief afforded by oxygen very uncertain. Dr. Smith also said he had used oxygen with satisfactory results in opium-poisoning.

Dr. Thompson, in closing the discussion, said that convulsions were produced in the animals experimented upon by the rapid increase of the pressure, and that such convulsions were quickly relieved by the rapid withdrawal of a portion of the pressure. He could not agree with Dr. Smith in his opinion regarding the saturation of the blood with oxygen, since he thought there could be no question that even under ordinary conditions the hæmoglobin was practically saturated with oxygen. In reply to Dr. Roosevelt, he said that many individuals suffered from dyspnœa whose blood contained more oxygen than that of those with anæmia or suffering from hemorrhages. Dr. Robinson was certainly mistaken in attributing any irritating effects to oxygen. Pure oxygen had no irritating effects whatever, as had been repeatedly demonstrated. It produced no burning up of the tissues, as had been formerly supposed, and he could see no advantage over ordinary air in the nitrogen monoxide referred to.

During the evening a cat and a dog were successively subjected to progressively increasing pressures of oxygen in the pneumatic chamber. When the pressure reached eighty pounds to the square inch the cat was seized with a convulsion, and the dog had a convulsion when the pressure reached a little above forty-five pounds. That this effect was not due to carbon dioxide was shown by the lime-water test. Both animals recovered after they were restored to the air.

A NEW METHOD OF DETERMINING WHETHER A CHILD IS STILL-BORN OR NOT.

The hydrostatic lung test for determining whether a child was still-born, or died after birth, is generally admitted to be unreliable. In fact, no one single test exists which can positively establish or deny as to whether a child was born dead or living.

In the *Archiv für Kinderheilkunde*, Band xi., Heft 1., Dr. S. S. Zaleski suggests a test which

depends upon the following facts. In the first place, the fœtal lungs only contain as much blood as is necessary for the nutrition of the pulmonary tissue, while the lesser circulation is only inaugurated after birth, and, as a consequence of this, the circulation in the lungs is in an instant many times increased. In the second place, the blood contains a constituent whose percentage is almost unalterable, and which is readily quantitively estimated,—namely, iron.

Therefore a lung in which the act of respiration has taken place will contain considerably more iron than one which has not respired. Dr. Zaleski, therefore, believes that from the amount of iron found in the lungs, it may be determined whether the child was born alive or dead.

Dr. Zaleski has estimated the amount of iron in seven cases. Four were cases of unmistakable dead birth; three, cases of infants born alive. In the former cases the average total amount of solids was 13.22 per cent., and of these, in the fresh state iron was represented by .0110; in the dry state, .0828. Of the three cases born alive, the average solids were represented by 15.87, representing in the fresh state .0188, and in the dry state .1182 per cent. of iron. In these cases the application of the hydrostatic lung test was very contradictory; one case, which was unmistakably still-born, giving a positive answer, another, which was unmistakably born alive, giving a negative answer.

From his studies Dr. Zaleski believes that he is warranted in drawing the following conclusions:

First.—The per cent. of solids, as well as the per cent. of iron, is considerably less in the lungs of children which have not breathed than in the lungs of children born alive.

Second.—The difference is especially evident in comparing in each individual case the amount of iron with the amount of solids.

Third.—Even in the comparison of the averages the difference is very perceptible.

Fourth.—The amount of iron in the lung-tissue increases with the age of the fœtus or the child.

Fifth.—Diseased conditions of the lungs have no marked influence on the amount of iron.

Sixth.—The imbibition of the pulmonary tissues with blood appears to be without influence of this test.

Seventh.—This test has never been found to be contradictory to other tests or to known facts.

Eighth.—The amount of iron in the lungs is invariably dependent upon respiration, and increases in direct proportion to the activity of the functions of the lungs.

From a theoretical point of view, the following objections may be made to this method:

First.—The process requires a special education, and the facility for making a chemical analysis. This objection may be met, however, by the fact that all the physician requires to do is to ligate the roots of the lungs when they may be subjected to the hydrostatic test, and then submit them to the chemist for analysis.

Second.—The difference in the amounts of iron is so small that an error may be readily introduced; in this connection, however, it is only necessary to remember that the analysis must be made by a practised chemist, and that the differences are too great to fall within the probable error.

Third.—The amount of iron may vary in different individuals, since the amount of iron in the liver and spleen are subject to sudden variations. This objection may be met by the fact that the liver and spleen are blood-making organs, and therefore the percentage of iron in them must be subjected to variation. This is not, however, the case with the lungs.

Finally, it must be admitted that further investigations are required before it can be positively stated that various pathological conditions, either of the mother and fœtus or the child, will have an influence on the amount of iron in the lungs, such as anæmia, leucocythæmia, or morbus Werlhofii, where the iron is diminished, or diabetes, where it is increased; while it must not be overlooked that, through neglect in ligating the umbilical cord, there may be serious bleeding, which will diminish the amount of blood, and, as a consequence, the amount of iron found in the lungs.

The author finally claims that this method is applicable to the examination of lungs which are already in a state of putrefaction, where, of course, other tests cannot be applied, and where artificial respiration has been employed. In the latter case, however, it must be determined whether artificial respiration has only led to the introduction of air into the alveoli, and not to the introduction of blood into the pulmonary capillaries. In addition, we may mention that DR. NIKITIN claims that if the stomach and intestine of the new-born child contained sufficient air to cause them to float on water, and if the artificial injection of air can be excluded, there is strong probability that the child was born living.

THE TREATMENT OF CHOLERA BY SUBCUTANEOUS INJECTIONS OF PERCHLORIDE OF MERCURY.

In the *Indian Medical Gazette* for July, 1889, SURGEON MAJOR OSWALD BAKER reports a case of a seaman, aged 22, who was admitted to the Moulmoin General Hospital with well-developed symptoms of cholera. The history of his attack was briefly as follows:

He was apparently well when he turned in on the preceding night, but in the early morning—2 or 3 A.M.—he was taken with profuse purging and copious vomiting, and by the time daylight broke, he was very ill, and barely able to stand.

He was carried from the gharry, and at once put to bed. A draught containing one drachm of liquor hydrargyri perchloride and ten minims of tincture cannabis indica was immediately given; hot-water bottles were brought for his extremities, and he was allowed ice to suck.

The draught was repeated at 2 P.M., but it was not probable it would be kept, for vomiting was constantly occurring, and, in fact, the medicine was forthwith rejected.

Mustard-plasters were prescribed for the præcordia and the epigastrium.

By 8 P.M. his condition was most unpromising; his pulse was rapid, feeble, and irregular in force; his voice, weak and hoarse from the first, was reduced to a whisper; although there had been no discharge from the bowels since 3 P.M., the vomiting did not abate, and his condition of collapse was becoming extreme.

It was at this stage that ⅓ of a grain of perchloride of mercury was injected deeply into the gluteal region. Two hours later there was a decided improvement in his pulse, and the state of general collapse was less pronounced. On the following morning it was evident that a reaction had taken place. His vomit, instead of being colorless, was stained with bile, his pulse was stronger, the voice fuller, and the body warmer. The repeated vomiting of clear bile-stained fluid continued throughout that and the following day, although the nourishment given was generally retained. He voided urine for the first time forty-three hours after the injection was given, the suppression having lasted in all for sixty hours, and from this time forth his restoration to health was sure and steady. Ten days later he had regained much of his strength, and was discharged from the hospital.

Mr. Baker states that he was led to employ an injection of the perchloride of mercury deeply into the muscular structure from the fact that its administration in the usual way was frustrated by vomiting, and from the fact that its therapeutic action was, in the presence of collapse, more likely to be exercised in the way it was administered than in the usual way of taking it into the stomach. The solution which Mr. Baker employed was prepared after Mr. Bloxam's formula, which is, chloride of ammonium, 16 grains; perchloride of mercury, 32 grains; dissolved in 2 ounces of distilled water. This solution is said to be permanent, and ten minims contain a third of a grain of the perchloride. Mr. Baker further adds that he has injected ten minims of this solution into the gluteal region of two hundred and twenty persons (not suffering from cholera). In these cases the injection was always followed by some swelling, which, in the majority of cases, took more than a week to disappear. Slight pain was produced by the injection, but, on the whole, the local inconvenience following the operation was insignificant; neither ulceration, suppuration, nor any obvious constitutional derangement was roused. The best site for the introduction of the needle appears to be on a line with the great trochanters, and some two inches internal to them, but absolute precision is not necessary.

THE THERAPEUTIC VALUE OF LIPANIN.

HAUSER reports the experience which he has had with lipanin in dispensary practice. It was given in small doses after meals, the dose ranging from 1 to 3 teaspoonfuls three or four times daily. It was used with thirty-eight children, ranging in age from 15 months to 13¾ years, for anæmia, chorea, rachitis, chronic tuberculosis, and scrofula, or during convalescence after acute febrile diseases, typhoid fever, and diseases of the digestive organs. The observations and experiments showed that it was usually taken with less repugnance than cod-liver oil, many children taking it without objection, especially if something be given to remove its taste. A peppermint lozenge or a piece of dry bread may be given for that purpose, and menthol may be used in cases of tuberculosis in the proportion of 5 grammes to 150 of lipanin. All patients increase in weight under its use except those who have hectic. The lipanin may be combined with different medicaments, or

with olive oil, mayonnaise, sauces, and salads. In the author's experiments it was well tolerated by patients who could not bear cod-liver oil even in small doses, and by those whose digestive organs were weakened. Patients with anæmia, chorea, and rachitis rapidly increased in weight under its use. In the chronic wasting diseases, especially in phthisis pulmonum, it was remarkable to see the favorable influence which was produced in the majority of cases upon the nutrition and upon the general condition. In those who had already become convalescent there was great increase in weight, while healthy children were not perceptibly influenced by its use. Lipanin was absorbed in these investigations to an extraordinary degree. The volume of fats and fatty acids recovered with the stools during its use varied within very narrow limits. The maximum of fats was .736 per cent., and of fatty acids .814 per cent. In children under 6 years of age the quantity given was ½ teaspoonful to a teaspoonful three times daily. One should begin with small doses, and gradually increase them, first giving them after meals, and finally before meals. Lipanin may also be given in hot weather without difficulty and with good results. The preparation of lipanin malt extract, consisting of 1 part lipanin to 2 of malt extract, is a very useful one, and is readily taken by children.—*Archives of Pediatrics*, July, 1889.

GLANDULAR FEVER.

Under this name, E. PFEIFFER recently described, at the Congress of German Naturalists at Cologne, a condition which is of frequent occurrence, and yet is not mentioned in text-books (*Wiener Medizinische Blätter*, No. 30, 1889). The affection is inaugurated with a chill, followed by fever, pain in all the joints, great restlessness, loss of appetite, and vomiting; its cause is unknown. The temperature will be found to be from 102.5° to 104° F.; the tongue slightly coated; the fauces slightly reddened, but without any deposit. In other respects all the organs are normal, with the exception that all the lymphatic glands of the neck, especially those at the posterior border of the sterno-cleido-mastoid muscle, will be found to be swollen and painful on pressure and on motion. In light cases the fever disappears on the second day, and the swelling disappears in a few days; in other cases, the disease, which at first was confined to one side of the neck, will extend to the other. The pharynx will be found to be inflamed, and there may be some coryza and cough. In such cases the fever will persist for several days; on the third or fourth day the liver and spleen may be found by palpation to be increased in size, and pain in the median line of the abdomen will be complained of. If the invariably favorable course of this disease was not recognized, serious alarm might be caused by the symptoms of this affection. The characteristic feature is the swelling behind the mastoid muscle. The affection appears to be of an infectious nature from the fact that it is apt to occur in epidemics which will affect entire families. Pfeiffer reports an instance where four children were similarly affected within two weeks; in all the glands of the neck were swollen and painful. It is, however, uncertain as to whether this affection is a special disease, or whether the glandular fever only represents an abortive state of some other affection, such as typhoid, measles, scarlet fever, or varicella. The treatment of this affection need only be confined to inunction with oil on the neck, covering the neck with cotton, and in severe cases confining the patients to bed.

At the same meeting DR. HEUBNER stated that he had seen similar cases in which no definite origin for these symptoms could be detected other than that they constituted a special disease.

SOME POINTS IN THE TREATMENT OF INTESTINAL OBSTRUCTION.

At the meeting of the Royal Academy of Medicine in Ireland, held June 7, 1889, MR. THORNLEY STOKER read a paper with the above title (*Medical Press and Circular*, August 14, 1889). He dealt chiefly with the treatment of those cases where the obstruction was, owing to the paralyzed condition of the bowel, due to the accumulation of fæces or flatus. In this class of cases a lumbar operation is rarely indicated, and, owing to the extreme meteorism, laparotomy is usually a very fatal proceeding. He urged the adoption of other measures previous to any precipitate opening of the abdomen, advocating the employment of pressure and massage, and the judicious use of purgatives. Of these latter remedies he considered undue fear existed. Of belladonna, when pressed to its full effect, he spoke highly, and quoted cases in evidence. Local treatment by rubefacients he stated his disapproval of, as he did also of opium, which he regarded as mask-

ing symptoms, and doing little or no good. Tapping the bowel with an aspirator-needle or fine trochar he had found of great use where much tympanitis existed. A large part of the paper was devoted to an attack on the "long tube," which he considers a dangerous and useless engine, productive of no effects which cannot be gained by the use of a shorter and safer instrument.

The PRESIDENT was of opinion, notwithstanding the strong outcry against opium, that that drug, if of use in any case of abdominal surgery, gave relief in intestinal obstruction. In his own practice he invariably used it subcutaneously. Inversion he had seen practised, but never with good results. The enema was of great use, not by O'Beirne's tube, but by the ordinary one. Puncture of the intestine also gave relief, but instead of the aspirator he preferred using a trocar (one-tenth of an inch in diameter) and canula.

DR. MYLES, observing that Mr. Stoker mentioned a case as presenting symptoms of paralytic obstruction, a difficult question in the examination papers—"Enumerate the different varieties of intestinal obstruction and give the diagnosis"—at once arose to his mind, and he said to himself, "Here at last the difficulty is solved." But it seemed that Mr. Stoker was carried away by his noble rage against O'Beirne, and forgot to give the information which he so anxiously anticipated. There were, however, some points extremely interesting raised. Mr. Stoker had stated that by cautious injection any fluid could be propelled to any distance along the colon. When he was house surgeon at Steeven's Hospital, in a case of constipation, he directed an injection to be given slowly till the man could hold no more, as he regarded the measure of the purgative to be the amount the man could hold. The operator proceeded leisurely and quietly with his task, and in twenty-five minutes the message was brought that he was still pumping. And what was the fact? With each stroke of the pump the fluid that was being injected came out of the man's mouth. In reference to the belladonna treatment, he had again and again seen it used in ⅛-gr. doses, but generally combined with opium. Although the theory was that opium was opposed to belladonna, Brunton showed that it acted in conjunction with belladonna, and, instead of producing paralysis, it converted the normal into a tetanic spasm, which was as near being tetanus as the muscle could go.

MR. CORLEY feared that Mr. Stoker's observations on the *furor operandi* might, as coming from a surgeon of his experience, have a more serious result than he anticipated; for the present tendency was to try a great many remedies before thinking of operative procedure. As regards puncture, he recalled a case in which he was called on to operate. The surgeons were in favor of laparotomy; the physicians, of colotomy. Lumbar colotomy was performed with success; but the patient died three days afterwards. Before the operation the patient had been punctured nearly a dozen times in various parts of the abdomen, a quantity of air escaping. Dr. Reuben Harvey made a post-mortem examination, but was unable to find the site of a single puncture. As regards opium, he coincided with Mr. Stoker, and he was sorry to hear the President giving the weight of his authority to the use of opium. He had found that it was a dangerous agent, masking the symptoms, while he doubted if it assisted the action of the bowels. Opium lulled the pain and the acute symptoms, but it landed the patient and the doctor in a fool's paradise. In his experience he did not remember a case in which he saw any advantage from it, while he recalled two or three in which the drug accelerated fatal termination by postponing the operation beyond the time at which it was likely to be efficacious. He did not think that most surgeons were likely to operate too soon, and that, notwithstanding the modern views of peritoneal surgery, they would be disposed to open the abdomen rashly for intestinal obstruction, remembering that every variety of intestinal obstruction had been known to yield to the influence of medicine.

MR. KENDAL FRANKS endorsed Mr. Corley's observations as to the likelihood of the opening passages in Mr. Stoker's paper being fraught with danger. He had himself never seen the abdomen opened too early, but he had seen it opened many times too late, and the tendency among young surgeons was not to open it in a hurry.

MR. WILLIAM STOKER said the choice of treatment, whether palliative or operative, depended on the diagnosis as to whether the obstruction was due to deficient force or to increased resistance. No doubt, the two conditions were interwoven; but once the surgeon made up his mind that the obstruction was due to increased resistance, he need not dread to interfere. He had himself tapped the distended bowel, and he never dreaded doing so, remembering that the three layers—namely, the muscular and elastic—between the serous and mucous, which were non-distensible,

would not continue opposite each other unless the distention remained constant, but would slip and leave a valvular opening. As regards medical remedies and the requisite doses, the extract of belladonna was a drug of varying potency.

DR. DOYLE considered it the duty of the medical man to administer the enema himself.

MR. W. THORNLEY STOKER, in reply, said he had at the outset disclaimed any intention of arguing against operation, and early operation, too, as he was not himself either afraid to use the knife or likely to avoid a sufficiently early operation. He had also particularized and dealt only with the class of cases in which operation was rarely, if ever, admissible,—namely, those in which the intestinal obstruction was due to fæces or flatus producing the paralysis of overdistention, and it was in reference to these in which he spoke of the remedies. He agreed with Mr. Corley's observations about opium. As regards tapping the bowel, he used an aspirating-needle the size of a French No. 5 catheter, with a stilette to clear it when it became impacted, but did not use the aspirator as a means of suction.

THE THERAPEUTIC ACTION OF BOLDO.

The value of the use of boldo in cases of hypertrophy and congestion of the liver is pretty well admitted. In the *Revue Medico-Pharmaceutique* for July 31, 1889, DR. CAMPENON writes that he has recently had under his care two cases of cirrhosis of the liver, characterized by increase in the volume of that organ, dilatation of the subcutaneous veins, and slight ascites, in which he attributes cure to the use of boldo. Dr. Campenon states that he has obtained the best results from the use of alcoholic preparations of boldo, especially in cases where there is at the same time dilatation of the organ and a burning sensation in the stomach.

Dr. Campenon prescribes boldo as follows: For the first day, 5 drops of the tincture of boldo, given in a little water a few minutes after eating; 6 drops are given the second day, and the dose is increased each day until 15 or 20 drops are given at a dose.

When this maximum is reached, the dose is then diminished little by little until it reaches 5 drops, and then again, for the second time, increased. To produce relief, the treatment must be of long duration, and attention must be given to regulating the patient's diet.

THE TREATMENT OF CERTAIN ACUTE COMPLICATIONS OF GONORRHŒA.

Gonorrhœa in the male is frequently the cause of two disorders, which always distress the patient and often annoy the surgeon by their intractability to treatment. A man who has had two or three attacks of gonorrhœa is but little troubled by a recurrence of it, but if it once be complicated with cystitis or epididymitis, he will thenceforth regard a clap with undisguised dismay; and if his medical adviser is accustomed to rely upon the commonly employed treatment of these complications, he, too, will not view the situation with equanimity, for, judging from common experience, few diseases of the male occasion more temporary dissatisfaction with treatment than these of the bladder and testicle secondary to gonorrhœa.

For these reasons the following methods of treatment proposed by DR. C. H. H. HALL, United States Navy, seem worthy of notice (*Sei-I-Kwai Medical Journal*, July, 1889). Immediately upon taking charge of a case of gonorrhœal epididymitis, Dr. Hall orders the application of a solution of 4 parts of nitrate of silver in 30 parts of sweet spirits of nitre, applied to the testicle with a soft brush.

Dr. Hall recommends sweet spirits of nitre as an application, because it dissolves the oil of the natural secretions, and therefore wets the part more effectually than water. After applying this solution once a day for two successive days, a piece of lint moistened with 30 parts of laudanum and 30 parts of solution of subacetate of lead to 440 parts of water, is laid upon the testicle and kept wet with this solution. The solution of silver nitrate so applied will result in the removal of a considerable part of the epidermis, but Dr. Hall writes that he has never observed any toxic effects from absorption of the opium or the lead. Combined with the use of the suspensory bandage, it is claimed that the effect of this treatment is prompt and complete relief, and a steadily progressive reduction of the inflammation, and return to the normal state within two weeks.

It often happens that about the time a patient is congratulating himself upon recovery from gonorrhœa, he begins to have frequent calls to pass the urine, is disturbed at night, has discomfort in the suprapubic region, and feels ill at ease after he has apparently emptied the bladder.

Ordinarily these symptoms will increase in severity until there is constant desire to pass

the water, vesical tenesmus, and acute aching pain in the suprapubic region, all symptoms of more or less acute cystitis. In September, 1887, a patient in the United States Hospital, Yokohama, with an aggravated condition of this sort, had been treated in the regular service of the ward for two months with everything that promised relief, including washing out of the bladder with hot solution of boric acid; but, although the symptoms had abated, there was still suprapubic pain, vesical tenesmus, and frequent micturition four times each night and each hour or two during the day. The well-known influence of vaginal injections of hot water upon pelvic inflammation suggested the use of rectal enemata in this case. Large enemata, from one and a half to three pints, were used each four hours. Relief was felt at once, and improvement manifest on the following day. At the end of a week all discomfort had disappeared, and the urine was passed but twice at night. At the expiration of the second week, patient was disturbed but once at night and was otherwise well.

DITHIOSALICYLATE OF SODIUM.

Dithiosalicylate is recommended by Dr. H. Linderborn as a substitute for the salicylate of sodium (*Revue Générale de Clinique et de Thérapeutique*, August 8, 1889). This body is formed by the combination of 2 atoms of sulphur and 2 molecules of the salicylate of sodium. It is a grayish-white powder, very hygroscopic, and very soluble in water. In the urine it does not form the violet reaction with perchloride of iron. In twenty per cent. solution it destroys various bacilli and microbes in forty-five minutes; in doses of 3 grains, repeated twice in twenty-four hours, it has succeeded in arresting articular rheumatism, even where salicylate of sodium had failed, and has been used by the writer with success in gonorrhœal arthritis without producing gastric trouble, ringing in the ears, or any tendency to collapse.

RUPTURE OF THE CORNEA TREATED BY EVISCERATION OF THE EYEBALL, AND THE INTRODUCTION OF A GLASS GLOBE INTO THE SCLEROTIC.

At a recent meeting of the Medico-Chirurgical Society of Montreal, Dr. Buller introduced to the Society a boy, 8 years old, who had received an injury to his right eye from a stick thrown at him by a playmate (*Montreal Medical Journal*, August, 1889). Dr. Buller first saw the patient eight days after the injury had been inflicted, when he found the eye shrunken and commencing to present characteristic appearances of traumatic cyclitis. There were two fresh scars from recent wounds in both upper and lower lids. The wound of the eyeball extended vertically through the entire cornea and for a short distance into the sclerotic, both above and below. The cornea presented the appearance of two small turbid cornea separated by a shallow groove. Perception of light was lost, there was no conjunctivitis, and the deeper structures had evidently not undergone any active inflammatory changes. The shrunken eyeball was quite soft and slightly tender to the touch. The condition was such as would evidently involve considerable risk to the other eye from sympathetic ophthalmia. The case was one which demanded some mode of treatment calculated to obviate this danger. Dr. Buller does not approve of removing the eyeball in children on account of the faulty development of orbit and conjunctiva, which this operation involves in young people, and the operation of optico-ciliary neurectomy would have, at best, left a very small and imperfect eyeball. The child being perfectly healthy, with no tendency to suppurative inflammation, Dr. Buller determined to try the operation recently devised by Dr. Mules, of Manchester,—that is, the insertion of a globe into the cavity of the sclerotic. The operation was done under rigid antiseptic precautions. The cornea was removed entirely, with so much of the sclerotic above and below, as to give the opening the shape and direction of a vertical ellipse. All the contents of the globe were carefully scraped out with a sharp scoop, and the bleeding from the inner scleral surface arrested by packing with aseptic sponges. All bleeding had ceased in about fifteen minutes, and the smallest-sized glass globe was inserted. This globe was perfectly smooth, and rather more than half an inch in diameter. The smaller size was selected in order to avoid all danger of undue tension when the lips of the scleral wound were united in a vertical direction by three silk sutures. The conjunctival aperture was then united horizontally also by three silk sutures. The eye was cleansed with a solution of corrosive sublimate (1 to 5000), and fine iodoform powder dusted in the conjunctival sac, and the lids were covered with absorbent cotton, likewise dusted with iodoform

powder, this being kept in place by a tolerbly firm bandage over both eyes. This dressing was allowed to remain undisturbed for forty-eight hours. When removed, the eyelids and orbital tissues were considerably swollen and tender, but both swelling and tenderness subsided in a few days under the application of cold aseptic compresses, and the case did remarkably well. An artificial eye was then inserted with very satisfactory results, as far as appearances were concerned.

There was no sinking of the upper lid, and the movements of the eye were apparently normal. The sutures in the sclerotic were hidden from view and created no irritation. Dr. Buller believes that the result is far more satisfactory than could have been obtained by enucleation or by optico-ciliary neurectomy.

ANTIFEBRIN IN QUINSY.

In the *Wiener Medizinische Blätter* for August 8, 1889, Dr. W. Sahli writes that on the second day of a violent attack of quinsy he took 7 grains of antifebrin, and within a quarter of an hour all headache and pain on swallowing or in mastication had completely disappeared. On the next day there was a slight return of pain, which was again almost immediately subdued by the repetition of the dose of antifebrin, and this treatment was continued on each reappearance of pain with the same results, until the disease had run its course.

Dr. Sahli refers to twelve cases of quinsy in which 4 grains of antifebrin likewise produced satisfactory results. The same effect was also observed by the writer in the relief of pain in angina of an epidemic of scarlet fever and diphtheria. It relieves pain in all movements of the throat, and, by rendering the operation painless, is a great assistance to gargling the throat, especially in children, while, of course, it also assists in the administration of food.

Dr. Sahli does not, however, claim that antifebrin is a specific for angina or diphtheria, since the pathological processes are not influenced by its administration. He administers it shaken up in a little spirits and syrup.

ERGOT IN CHILDBED.

Dr. Pinzoni, of Bologna, has made some interesting clinical experiments in order to determine, with something like precision, the value of ergot in childbed. He administered ergot systematically to ninety-one lying-in patients, generally in the form of about 2 grammes of the powder daily. Seventy-nine similar cases were treated without ergot. After comparing the series, he came to the following conclusions: Ergot has little or no influence on the temperature, at the most a slight rise is occasionally observed. It hastens the pulse a little, yet has no marked influence on the physiological slackening of the pulse observed during the first days after delivery. The physiological increase in the secretion of urine during the first days is favored by ergot. The involution of the uterus, according to Dr. Pinzoni's researches, is either totally uninfluenced by ergot, or slightly retarded. The escape of the lochia remains normal when that drug is given; but clots, as universal experience has proved, are more readily expelled. The lochia seldom smell fetid when the ergot is taken. Ergot delays the after-pains in primiparæ, and lessens them when they have already commenced. The secretion of milk is retarded and lessened by ergot, and sometimes completely suppressed. Ergot seems, in the belief of Dr. Pinzoni, to be a prophylactic against puerperal fever, an indirect antiseptic agent. When infection has already taken place, ergot appears, on the other hand, to hasten the entrance of the virus into the circulation. Dr. Pinzoni's researches appeared in the *Bollettino delle Scienze Med. Bologna*, series vi. vol. xx.—*British Medical Journal*, August 10, 1889.

THE USE OF IODIDE OF POTASSIUM IN LARGE DOSES.

Two years ago Dr. Haslund recommended the treatment of psoriasis by the administration of excessive doses of iodide of potassium. His practice was to commence with 45 or 60 grains daily, and every two or three days to increase the dose by 20 or 30 grains, until three hundred to four hundred and fifty, or even seven hundred and fifty grains were given each day. After each dose a large glass of water was taken, so as to cause sufficient dilution of the drug in the stomach.

The duration of treatment, according to Haslund, was about five weeks. M. de Molenes likewise published two cases which were cured by this treatment, one of the cases taking four hundred and fifty grains daily, and the other six hundred grains each

day. But it is well known that certain patients are absolutely incapable of supporting even small doses of the iodides without producing serious effects, and all have failed to explain the intolerance of iodides in some cases, in small doses, while these immense quantities may be given in other cases without bad effect.

According to Aubert, the association of small doses of belladonna with the iodides will render the system less susceptible to the latter; while HUCHARD (*Revue Générale de Clinique et de Thérapeutique* for August 8, 1889) claims that the association of milk and other diuretics with the iodides will diminish the chances of intolerance by assisting the elimination of the drug through the kidney. Dr. Huchard also claims that the association of arsenic with the iodides will produce the same effect, giving one drop of Fowler's solution for every fifteen grains of the iodide, although more than twelve to fifteen drops of Fowler's solution should never be given in one day. A remarkable fact in this connection is that sometimes large doses of the iodide will be better supported than small doses. This, according to Huchard, is to be explained as attributable to the diuretic effects of large quantities of iodide of potassium. In all cases where the iodides are prescribed in large doses, lesions of the stomach, intestines, or kidneys should first be excluded.

INTRAVENOUS INJECTION OF CARBONATE OF SODIUM IN POISONING.

DR. SANQUIRICO, of Sienna, treats cases of poisoning by intravenous injection of large quantities of an eight per cent. solution of carbonate of sodium, and so producing a very active secretion of urine. He was able to give the animals he experimented on (rabbits and dogs) considerably larger doses of some poisons that are usually lethal without fatal results, if he at the same time injected his solution of sodium. When he used both the sodium carbonate injection and the usual antidotes, he was able to save his animals even after doses of poison that would have certainly proved fatal if only one of the two modes of treatment had been applied. The only poison which withstood this combined treatment was nicotine. He points out that the diuretic treatment can only be successful when the functional power of the heart and of the central nervous system have not been so seriously paralyzed as to prevent antidotes from exercising their influence, or so as to cause a diminution of the secretion of urine in consequence of the weakened action of the heart.—*Lancet*, August 24, 1889.

SOME POINTS IN THE TREATMENT OF GONORRHŒA.

We recently called attention to the method of treatment of gonorrhœa proposed by Dr. E. P. Rice, which consisted in introducing a soft rubber catheter into the urethra as far back as the prostatic portion, through which he injected two drachms of an emulsion consisting of three drachms of boric acid and one ounce of glycerin.

In the *Medical Record* for August 17, 1889, DR. BRANSFORD LEWIS takes exception to several points in this method of treatment. In the first place, he claims that to deposit two drachms of any fluid in the prostatic urethra would almost assuredly defeat the primal object of the operator,—that of spreading his application over the portion of the urethra that is inflamed; for the muscular structures surrounding the urethra are so arranged that, at the triangular ligament, they divide the canal into two parts,—the anterior and posterior urethra. That this division is real, physiological as well as anatomical, and not merely arbitrary, and for the sake of making finer but impractical distinctions, may be demonstrated in various ways, one being the very fact that, if we inject a quantity of water, say a quart, through a catheter whose eye is just distal to the triangular ligament, that same amount will return alongside the catheter and escape at the meatus; whereas, if we place the eye of the catheter just beyond (proximal to) this muscular ring, and then inject, the fluid will not reappear at the meatus, but will pass on into the bladder. Indeed, this is the mode of irrigating the posterior urethra originated and practised by the recently deceased Ultzmann in chronic posterior urethritis. So, therefore, the bulk of the two drachms (aside from what has remained within the catheter) used by Dr. Rice, probably exercises its effect on the mucous membranes of the posterior urethra and bladder, and all that reaches the inflamed area does so by following in the track of the catheter as it is being withdrawn.

It has been determined that the natural rate of progress of the gonococci, as they invade the tissues from the meatus backward, is notably a slow one; that, unless carried back by some accident or instrumentation, they do not

reach the bulbo-membranous neighborhood until about the third or fourth week of the disease; and, furthermore, that it is only a minority of the cases in which the posterior urethra is involved at all, being preserved from this by the musculo-membranous barrier before mentioned.

It will be readily conceded, of course, that to treat any portion not involved in the inflammation is nothing short of "meddlesome surgery," aside from the risks, to which it leads, of infecting innocent tissues. So that the corollary of the above premises would lead us:

1. To refrain from passing our instrument to even the deeper portion of the anterior urethra, in the early stages of the affection; and,

2. Never to pass it beyond the compressor urethræ muscle, unless the posterior urethra be affected, which is always shown by well-defined symptoms.

Another question comes up: Is glycerin the best vehicle we can use in making our antiseptic emulsion? From its hygroscopic nature and rubefacient effect, is it not likely to be irritating, rather than soothing, to the raw and tender membrane? And, again, in the presence of water, glycerin loses entirely its lubricant properties; with the first urination out it goes, and the medicament with it, so that, until the next treatment, the membrane is minus the beneficent influence of the antiseptic.

None of these objections applies to vaseline or lanolin. They are perfectly bland and unirritating, giving rise, because of their presence, to absolutely no pain or irritation; but, on the contrary, mollifying that which already exists, by keeping the inflamed surfaces from rubbing against one another, and also, by the coating which they form, preventing the scalding contact of the urine. Water has little or no effect on them, so that they are persistent and adhere to the canal-wall even after several urinations; this assures the continuous application of the remedy, as well as of the protecting vehicle, and obviates frequent repetition of the treatment.

Of the two, vaseline and lanolin, the latter, in Dr. Lewis's estimation, is preferable. It is a far more elegant preparation; is more readily absorbable, carrying with it into the subepithelial layers, the stronghold of the cocci, the germicide with which it is charged; and lanolin is antiseptic in itself.

As a means of introducing this preparation, Dr. Lewis has been using a hard-rubber rectal ointment-applicator, modified by having a catheter-end, four or five inches long, which may be inserted into the urethra to any depth desired; the screw-piston serving to express the ointment at the proper time.

Boric acid is, doubtless, an excellent remedy; it fulfils two essential requirements: it is antiseptic, and at the same time unirritating. Dr. Lewis has been in the habit of using resorcin, three or four per cent., to which, in the later and subacute stages, he adds some antiseptic astringent, such as the sulpho-carbolate of zinc.

AMYLENEHYDRATE IN EPILEPSY.

WILDERMUTH writes in the *Deutsche Medicinische Wochenschrift* for August 15, 1889, that he has in a number of cases obtained the best results in epilepsy from the use of amylenehydrate, and maintains that its employment is especially indicated when the epileptic attacks rapidly follow each other,—when there is marked bromism, so that a temporary use of some other remedy is necessary, and in nocturnal epilepsy, either alternately with bromides, or, in new cases, combined with atropine. The dose which he gives is from 30 to 60 grains in a ten per cent. watery solution. In some cases the amount given in a day may be increased up to two drachms without disadvantage. The taste may be disguised by dilute wine or syrup. If the patient has previously been under the influence of bromide preparations, the dose of the bromide may be rapidly diminished, and if the improvement continues, may be entirely suspended. Hypodermic injection of pure amylenehydrate may be given directly during the convulsion. Dr. Wildermuth adds that he has never seen any unfavorable after-effects follow the use of this remedy, with the exception that after a very prolonged use of very large doses there is considerable somnolence produced, and a certain amount of gastric disturbance. In many cases he writes that he has seen the convulsions entirely disappear after six or eight weeks' employment of this medication.

ANTISEPTIC MIDWIFERY AND PLACENTA PRÆVIA.

At the recent meeting of the British Medical Association (*Lancet*, August 17, 1889), DR. CULLINGWORTH opened this Section with some suggestions towards the further application of antiseptic principles to midwifery practice. He pointed out that the very fact of the use of

chemical disinfectants being an essential part of the antiseptic method carried with it the danger of regarding the part they play in the treatment too exclusively, and of neglecting other means of insuring antiseptic cleanliness, which, though perhaps subsidiary, are nevertheless of the greatest importance. Among these means he particularly mentioned the avoidance of frequent vaginal examinations, especially during the first stage of labor; the immediate removal from the uterus of matters retained either after labor or after an incomplete abortion; the desirability of allowing patients after a normal labor to sit up in bed occasionally on the second or third day, so as to carry out the great antiseptic principle of drainage; the immediate suture of the perineum wherever the tear is at all considerable; and the more general substitution of absorbent pads for the old-fashioned linen diaper. Our zeal for the safety and well-being of the recently-delivered mother ought not to make us wholly unmindful of the newly-born child. Could we usefully apply antiseptic principles to the management of the infant? The answer was, that we could in at least two ways,—viz., in the adoption of means to prevent ophthalmia, and in the mode of dressing the remains of the umbilical cord. In regard to the former, Dr. Cullingworth recommended, in addition to the wiping of the child's eyes with a clean, soft, dry cloth as soon as the head was born, and if possible before the eyes were opened, the application of a solution of corrosive sublimate (1 in 3000) by squeezing over each eye a saturated pledget of cotton wool immediately after the first washing. Credé's method of dropping in a two per cent. solution of silver nitrate need only be adopted in cases where the mother was known to have suffered from a purulent vaginal discharge. The report of a committee of the Ophthalmological Society showed that from thirty to forty per cent. of the inmates of blind institutions in Great Britain and Ireland owed their blindness to purulent ophthalmia in their infancy; hence it was not unreasonable to infer that, by the adoption of the means of prevention here suggested, the amount of blindness at present existing in this country might be diminished by one-third. With regard to the dressing of the umbilical cord, it was pointed out that the normal course of events was for the remains of the funis, after division and ligature, to dry and shrivel up, and for separation of the desiccated and dead tissue to take place within a few days, leaving a raw surface analogous to the placental site on the inner aspect of the mother's uterus, and liable, like it, to be a channel for septic absorption. The objects to be aimed at, therefore, were to secure (1) the normal desiccation of the cord before its separation, and (2) an aseptic condition of the wound left when separation has taken place. The method recommended was, after drying the surface of the cord, to powder it plentifully with powdered starch and wrap it in a square of antiseptic gauze. The umbilical wound should be dusted freely with finely-powdered boric acid, and covered with a pad of dry absorbent wool. Allusion was then made to the sectional arrangements, and especially to the considerations which had led to the selection of subjects for discussion. The address concluded with some remarks on the combativeness of the present race of gynæcologists, which was to be explained by the science of gynæcology being in its youthful stage. When our knowledge had a firmer basis, we should differ less.

On the termination of the President's address, Dr. Braxton Hicks opened a discussion on the treatment of Placenta Prævia, and recommended the following method: 1. After the diagnosis of placenta prævia is made, proceed as early as possible to terminate pregnancy. 2. When once we have commenced to act, we are to remain by our patient. 3. If the os is freely expanded and the placenta marginal, rupture the membranes, and wait to see if the head is soon pushed by the pains into the os. 4. If there be any slowness or hesitation in this respect, employ forceps or version. 5. If the os is small and the placenta more or less over it, carefully detach the placenta from round the os, and if no further bleeding occurs we may wait an hour or two; but should the os not expand, and if dilating bags are at hand, the os may be dilated. If it appears that the forceps can be admitted easily, they may be used; but if not, version by the combined internal and external method should be employed, and the os plugged by the leg or breech of the fœtus; after this is done, the case may be left to nature, with gentle assistance, as in footling and breech cases. 6. If the os is small, and if we have neither forceps nor dilating-bags, then combined version should be resorted to, leaving the rest to nature, gently assisted. 7. If during any of the above manœuvres sharp bleeding should come on, it is best to turn by the combined method in order to plug by breech. 8. When the fœtus is dead, or labor occurs before the end of the seventh month, version by the combined method, no force following, is the best plan. To these Dr. Brax-

ton Hicks added, if we employ a routine method in most cases, it will be found that version by the combined method, no force following, gives a result as good as, if not better than, any. As to after-treatment, act on modern principles. Should oozing occur after expulsion of the placenta, swab the lower uterus by styptics, and irrigate the uterus daily with some antiseptic solution, and particularly, if irrigation cannot be done, insert iodoform pessaries in the vagina. This is especially useful if the outlet of the uterus is blocked by adherent clots.

Dr. Murphy (Sunderland) strongly urged the necessity of realizing the extreme danger of leaving cases of placenta prævia to go on after they were once diagnosed, and wished to establish a rule that premature labor should be induced as soon as it is ascertained that the placenta presents, after the seventh month of pregnancy, and even before this should bleeding be serious or frequently recurring. He advised that the obstetrician should remain in constant attendance during the whole period of labor, which could be best induced by Barnes's bags, and then the question must be decided how further to conduct it. Generally separation of the placenta, full dilatation of the os, and bipolar version would give the best results. He submitted a table of thirty-eight cases, with two deaths; there had been a series of thirty-two consecutive recoveries included in this list.

The President read a letter from Dr. Lomer, in which he gave the greatest credit to Dr. Braxton Hicks for his method of treatment. He had treated twenty-eight cases by the combined method of turning, with one death of the mother and with thirteen living children. Putting together all the German statistics, there were one hundred and ninety treated by Dr. Hicks's method, with only nine deaths. Dr. Lomer's rule was as follows: Turn, and then wait; consider the case as being simply one of foot presentation, in which there is no other reasonable necessity to extract the child than the impatience of the operator. Should hemorrhage occur in the mean time, then naturally it is right to perform slight tractions on the foot in order to make the breech of the child tampon the bleeding parts; this traction ought, however, not to be a "hastened extraction."

Dr. Robert Barnes said, if he had been a German, probably what was now called Bandl's ring would have been styled Barnes's boundary line, as he had long ago described it as the boundary line of dangerous hemorrhage, which must be dilated to allow the child's head to pass. He recommended (1) puncture of the membranes, (2) separation of the placenta, (3) dilatation of the os by his rubber bags, and (4) forceps or turning according to the circumstances present. He said the prophylaxis of placenta prævia was of importance, as this complication was liable to recur. Attention should be given to the endometrium, so as to get it into a healthy state.

COCILLANA IN DISEASES OF THE LUNGS.

In the Therapeutic Gazette for August 15, 1888, we published a paper by Dr. H. H. Rusby on the use of cocillana bark in catarrh. Dr. Rusby's results indicated that the cocillana bark was a powerful emeto-cathartic and expectorant, very similar in its effects to ipecacuanha, and dangerous when taken in large doses. Dr. Rusby was, unfortunately, prevented from continuing his researches, but his work has led to the investigation of the properties of this plant by Dr. David H. Stewart, who has published his results in the *Philadelphia Medical News* for August 24, 1889.

Dr. Stewart states that he has notes of forty cases in which cocillana was prescribed. These comprise ten of acute, one of subacute, and nineteen of chronic bronchitis, five of broncho-pneumonia, and five of phthisis. Of these cases, the shortest time that any were under treatment by cocillana was six days, and the longest twelve weeks. While he further adds, that in many of the cases other drugs had been unsuccessfully tried before cocillana was begun. In bronchitis, the results, indicated by the notes published, did not appear to have been very satisfactory, the drug appearing to have but little effect on the disease.

In chronic bronchitis the results were more satisfactory, five cases being cured, while three were decidedly and two moderately benefited. All of the four cases of broncho-pneumonia were improved as regards cough and expectoration, while the only case of phthisis appeared to be uninfluenced by the use of cocillana. In all of the cases treated it was stated that where cough was not removed, it was lessened, while expectoration was either diminished in amount or frequency, while it is further stated that in cases where expectoration was difficult before cocillana was begun, it became less so under the use of this drug. In two cases slight temporary nausea was produced by the use

of the drug, while in three of the twenty-one cases it was noted that the bowels were somewhat looser while cocillana was being taken. Dr. Stewart concludes, from analysis of his cases, that cocillana is serviceable in bronchial catarrh, especially the subacute and chronic forms, when accompanied by scanty or moderately profuse secretion, whether the cough be tight or loose. It seems to possess the power to render cough less frequent and difficult, and the bronchial secretion less viscid and more easily expectorated, while at the same time it diminishes it in amount.

Perhaps the best preparation of cocillana for administration is the fluid extract, because of the relative smallness of the dose; seven and one-half minims of it equal about half a fluidrachm of the concentrated tincture. The fluid extract is to be preferred to the tincture in cases of acute bronchitis, since the amount of alcohol contained in the latter is apt to aggravate the inflammatory condition. In cases of chronic bronchitis, broncho-pneumonitis, and the bronchitis intercurrent with phthisis, the tincture is not open to this objection. The dose of the concentrated tincture employed in most of the cases is somewhat too small, an average dose equalling about three-fourths to one fluidrachm.

SULPHOLINIC ACID AS A SOLVENT.

This acid is obtained by the action of sulphuric acid by a complex chemical process on vegetable oils, and is rendered neutral by repeated washings with a solution of chloride of sodium and ether. When concentrated it presents the appearance of a yellowish liquid, with a neutral reaction; a taste at first sweet, then bitter and astringent. Its specific weight is 1023. It is soluble in all proportions of alcohol, and miscible with one to two parts of water without losing its oily character. Dissolved in a large quantity of water, it forms a clear liquid, slightly opalescent, and remarkable for its great affinity for water. It does not decompose, even when heated for some time up to 100° C. At a temperature below 0° C. it is converted into a yellowish mass, which resembles vaseline. It combines with a great number of various substances, which are then either completely soluble in water, or readily form emulsions; such, for example, as ether, chloroform, benzine, terebenthine, bisulphide of carbon, oil of mustard, and all the etherial oils. Heated, or submitted to ebullition, it dissolves numerous organic and inorganic substances, such as sulphur (two per cent.), iodoform (three per cent.), camphor (twenty-five per cent.), naphthalin, chrysophanic acid, and numerous coloring-matters. These solutions readily penetrate the skin, which completely and rapidly absorbs them. It is thus seen that sulpholinic acid possesses remarkable properties as a solvent, and it is superior to vaseline, oleic acid, glycerin, and other vehicles commonly prescribed for external use. In reply to the statement that sulpholinic acid is a "universal solvent," we might inquire, In what can it be kept?—*Journal de Médecine de Paris*, August 11, 1889.

ANTACID REMEDIES IN DYSPEPSIA AND GRAVEL.

At the recent meeting of the British Medical Association (*Lancet*, August 17, 1889), the President of this Section, SIR WILLIAM ROBERTS, gave an address upon "Some Practical Points in the Use of Antacid Remedies in Dyspepsia and Gravel." He remarked upon the great change which had taken place in the minds of medical men regarding the action of remedies. Forty years ago the leading minds of the profession seemed to have regarded with a sort of despair any hope of seriously influencing the issues by the use of drugs. Some of them even gloried in a course of *laisser aller, laisser faire*, and turned their attention entirely to a study of the natural history of disease and the minutiæ of morbid anatomy. Now all this was changed. A more exact investigation of the fundamental action of drugs on the tissues and organs, and the discovery of the remarkable correspondence which has been found to exist between the chemical composition of substances and their physiological effects, have given a new and extraordinary impetus to therapeutical studies. Sir William Roberts went on to say that there were few simpler problems than those relating to the palliative treatment of acid dyspepsia and the chemical prophylaxis of uric acid gravel, but there were some practical points in carrying out the treatment which were neither simple nor well known.

Antacid agents might be classified into those which were designed to take effect in the stomach, or gastric antacids, and those which were designed to take effect in the kidneys, or renal antacids. The gastric

antacids in common use consisted of the alkaline and earthy carbonates and lime-water. Renal antacids combined, in addition to these, the acetates and citrates of potash and soda, which were changed in the primæ viæ into carbonates of these bases. Gastric antacids were employed in two distinct classes of cases,—namely, in acid dyspepsia, and in a variety of conditions characterized by great irritation of the stomach, often with vomiting, which we sought to allay by the administration of milk mixed with lime-water. For acid dyspepsia the lozenge was the best mode of administration of an antacid. The Pharmacopœia had two lozenges of this kind,—the troch. sod. bicarb. and the troch. bismuthi. The latter was to be preferred. It owed its antacid properties to the chalk and magnesia which it contained, the bismuth being probably inert. Many lozenges sold in the shops contained pungent spices which were very injurious. The Vichy lozenges were valuable, but rather costly. It was well to vary the antacid from time to time. The question might now be put, Is there any harm in the practice of habitually using antacids for the relief of acid dyspepsia? He had naturally at one time regarded the practice with misgivings, but a more extended experience had led him to believe that it was harmless. He used the bismuth lozenge largely, but with the following precautions: They were not to be used at or near meal-times; they were not to be used regularly or systematically, but only when gastric pain was present and produced real discomfort; lastly, the use of the lozenge was to be discontinued if it failed to cut short the pain. Lime-water and milk was a favorite remedy, and often very successful. It sometimes failed, owing to the very low saturating power of lime-water. It was often desirable to substitute a solution of from five to ten grains of bicarbonate of sodium per ounce for the lime-water. The use of renal antacids rested on an equally rational basis. To prevent uric acid gravel forming we had only to keep the urine alkaline; but, simple as this was, there were some practical difficulties in the way, owing to the persistence of the tendency to the uric acid formation. It was very important to remember that this tendency did not last throughout the entire twenty-four hours, the necessary conditions being only present during the hours of sleep. It followed that if we safeguard the night, the day might generally be left to take care of itself. In the milder cases a full dose of the alkalizing agent at bedtime was sufficient. The citrate of potash was the best preparation. The dose for an adult should not be less than from 40 to 60 grains, dissolved in three or four ounces of water. In severer cases a second dose should be taken about the middle period of the hours of sleep. In still more severe cases additional doses might be required, but usually only temporarily. The essential point in the prophylactic treatment of uric acid was to guard the urine from precipitating within the precincts of the kidney. An antacid which was too feeble to render the urine actually alkaline might postpone the time of precipitation.

EXCISION OF THYROID IN GOITRE.

According to the Vienna correspondent of the *Medical Press and Circular* of August 21, 1889, DR. PUKY, Buda-Pesth, has recently removed six goitre tumors with success by partial excision. It may be remembered that surgeons have not been successful in the past in the total removal of the thyroid gland, although at one time it was assumed as a logical operation, and strumectomy recognized as a surgical term. Before this had been long adopted it was found that total removal of the thyroid gland produced a cachexia, which went by the appellation of cachexia strumapriva, or, more properly, cachexia thyropriva. This cachexia thyropriva appears about a month after the excision of the gland, and after the wound has healed, in the form of a general illness, accompanied by a number of changes, as swelling of the face of a yellow, wax-like color, and the patient's movements give one the impression of an idiot. Later on, the legs and arms begin to swell, the surface of the body becomes dry, swollen, soft to the touch, no perspiration, the hair dry, accompanied by shivering. When these symptoms are coming on, the patient feels the legs and arms weak, with a cold, crawling sensation in them, while the general activity of the body is reduced. Muscular paralysis, or atrophy, sets in, but the most remarkable symptom is the slow, clumsy mode of speech, which the patient attributes to his tongue being too thick and heavy.

With this change of the body the brain equally suffers. The patient becomes dull and apathetic, mental activity becomes lost, and he complains of his sight and hearing. The internal organs give no indication of change. The chronic cases observed resemble an accentuated state of anæmia, except that the white

blood-corpuscles are increased, while the number of red corpuscles are diminished. What the real cause of this train of symptoms is due to has puzzled inquirers and physiologists to explain. It is to be observed that this cachexia thyropriva takes place as commonly after the removal of a cystic goitre as after a parenchymatous goitre, without any relation to the magnitude of the operation, the blood lost, or the healing process of the wound. But when the gland is partially removed, these symptomatic phenomena are absent, which forces us to conclude that the removal of the gland disturbs the hæmogenic function of the blood. But it would appear that this functional change is not similar to that performed by the spleen or the marrow of bone, else these functions might be increased to such an extent as to carry on a fairly normal condition of the body. It is also remarkable that, after thyrectomy, no one has observed either any enlargements about the spleen or leukæmia. Dr. Credé supposed that after removal of the spleen the hæmogenic function was carried on by the thymus gland, as it was found in his cases where he had removed the spleen, that leukæmia soon appeared, and that four months after the operation the thymus gland became tender and greatly swollen, but that after the tenderness and swelling disappeared the blood returned to its normal condition. From this Credé inferred that there was a reciprocal function between the spleen and the thymus gland. How far we can follow these hypotheses is very doubtful, but it is evident that the thymus gland has some direct or indirect function in the hæmogenic process of the organism, but whether the function is confined to the selecting of material from the blood which it elaborates or transforms, or whether it appropriates a particular product of the hæmatic fluid which is indispensable for the proper nutrition of the nerve system, is not yet clearly understood. From the fact that the cachexia thyropriva phenomenon does not appear immediately after the operation of thyrectomy, but coming on weeks and months after, and approaching gradually, leads many authors to believe the disorder to be of a nervous character rather than hæmatic. Puky now carries us farther into a maze of probabilities, and assures us that myœdemas also produce this cachexia thyropriva, as the thymus gland becomes reduced, in some cases almost disappears.

He related two cases of myœdema observed by Dr. Ujfalussy, where, in one of the cases, the thymus gland was greatly enlarged, but Puky thought this case more properly belonged to the acromegalia, which was closely allied to myœdema, as the former is more prone to attack bony processes. In accordance with this knowledge of the thymus, he conducted his operations with the object of removing only part of the enlarged thyroid gland, in which he was successful in averting this cachexia thyropriva. All the cases healed within twenty-four days, and are doing well.

THE DIURETIC POWER OF CAFFEINE WHEN ASSOCIATED WITH PARALDEHYDE.

Impressed by the results obtained by Von Schröder as to the diuretic action of caffeine, CERVELLO tested the diuretic powers of the combination of caffeine and paraldehyde in the case of a man, 40 years of age, suffering from immense intraperitoneal effusion produced by venous congestion from heart-disease (*Schmidt's Jahrbücher*, August 15, 1889). As a result of the administration of this combination the amount of urine was more than doubled and the ascites markedly reduced. The same combination was also employed in the case of a man, 22 years of age, likewise suffering from œdema and dropsy, as a consequence of heart-disease, and in cases of chronic nephritis with œdema the diuretic action was also very pronounced, and resulted in the removal of the effusion. Finally, notes are published of a case of sero-fibrinous pleurisy with abundant exudation, but with no tendency for reabsorption, in which the combination of paraldehyde with caffeine produced disappearance of the effused liquid. The paraldehyde was given in capsules, 30 to 45 drops in two or three doses at evening, so as to combine the sleep produced by paraldehyde with the natural sleep. Caffeine was given in doses of from 4 to 8 grains. In case of ascites from cirrhosis of the liver, in accordance with general clinical experience, caffeine failed to produce any diuretic effect.

THE TREATMENT OF ACNE AND ITS ETIOLOGY.

M. BARTHELÊMY, of Paris, introduced the subject of the etiology and treatment of acne at the meeting of the International Congress of Dermatology and Syphilography, recently held in Paris. He alluded to the fact that, while it was well known that the ingestion of improper food, or a simple indigestion, gave

rise to certain cutaneous eruptions, such as urticaria, etc., he believed that a form of acne might have a similar origin (*Medical Press and Circular*, August 28, 1889). M. Bouchard published some time ago a work on the troubles of digestion and upon certain auto-intoxications, the consequence of dilatation of the stomach, and in it he says that these conditions provoke a form of acne which he (Barthelémy) had observed very frequently within the last five years, the period during which he has studied the question closely. Out of one hundred and sixty-nine cases of acne he had discovered dilatation of the stomach one hundred and sixty-five times. The treatment should be directed, of course, to the removal of the cause. Laxatives, such as cream of tartar and prepared chalk should be given, also tonics, and even cod-liver oil. Gastro-intestinal fermentation should be controlled by chlorohydric acid, pepsine, etc. The skin should not be neglected, sulphur-baths taken twice a week, rubbing with black soap, and finally with spirits of camphor, or some certain antiseptic ointment.

THE INFLUENCE OF BROMIDE PREPARATIONS ON MENSTRUATION.

In the *Wiener Medizinische Blätter* for August 1, 1889, Dr. M. Ernst calls attention to a fact which has, perhaps, been already frequently observed by others, that bromide preparations, especially bromide of potassium and bromide of sodium, exert a marked retarding influence on the periods of menstruation. He reports, as illustrative of this statement, the case of a young girl, 18 years of age, who was under treatment for epileptic convulsions. For the four previous years she had menstruated regularly, and, according to the mother, the first epileptic attacks occurred when she was six years of age, and since puberty the intervals between the convulsive seizures had been rapidly decreasing. For the last few months the patient had been taking thirty, and then later forty-five, grains of bromide of sodium daily, with the result that the attacks appeared at much longer intervals, and were much milder in character. At the same time it was noticed that the menstrual periods, instead of occurring perfectly regularly as before, now occurred only every five or six weeks, and sometimes eight weeks elapsed before the reappearance of a period. A second similar case is also referred to, likewise that of an epileptic woman, in whom again the menstrual periods were retarded in their appearance under the influence of the bromides. These cases seem to prove that the interference with menstruation was not attributable to the epilepsy itself, but seem to show that it was directly due to the action of the bromides. Further observations are desirable to determine whether this result is accidental, or whether it may be expected to follow prolonged use of the bromides.

PEROSMIC ACID IN EPILEPSY.

Dr. Carl Schrœder has administered perosmic acid to eight cases of epilepsy, in doses of 1/6 of a grain daily in pill form, and has published his results in his inaugural thesis presented before the University of Kiel.

His results show that the value of perosmic acid in the treatment of epilepsy is negative. He administered it in eight cases, not one of which can be regarded as cured. Two were somewhat improved, while in the other six no action whatever was perceptible. Dr. Schrœder suggests that, perhaps, if the treatment had been more prolonged, the results might have been somewhat more favorable, since his results are by no means as satisfactory as those of others who have experimented with this drug in epilepsy.

THE TREATMENT OF NIGHT TERRORS IN CHILDREN.

Nearly all practitioners have seen numerous instances occurring in children from 2 to 10 years of age, who wake up once, or oftener, during the night in a state of extreme terror, of apparently the most causeless nature. In these cases the children will almost, if not always, be found to be of an inherited nervous temperament, or, it has been stated, that a common cause of this condition is the abuse of alcoholic liquors by the wet-nurse. Ollivier (*Revue Mensuelle des Maladies de l'Enfance* for August, 1889) attributes the condition, almost without exception, to a developing form of hysteria, claiming that in ninety-nine out of one hundred cases such will be the cause. This seems somewhat exaggerated, but the advice of Ollivier to treat all such cases as of a truly nervous origin is worthy of attention. A warm bath given at bedtime, or 7½ to 15 or 30 grains of bromide of potassium and sodium,

or some preparation of valerian, chloral, or antipyrin, will nearly always succeed in quieting the patient. Opium, however, or any of its derivatives, is absolutely contraindicated.

TREATMENT OF CANCER OF THE RECTUM.

At the recent meeting of the British Medical Association (*Lancet*, August 17, 1889), Mr. Jessop, the President of this Section, introduced a discussion upon the "Treatment of Cancer of the Rectum." As regards the treatment of cancer by drugs, his attitude was one of hope and even faith in the future, but absolute distrust in the past. Some Pasteur of the future might yet discover a cure for cancer, but the claims put forward for China turpentine or any other drug rested upon the slenderest of foundations. Cancer never yet was cured, although medicines might give great relief. He passed on to operative treatment of cancer of the rectum. Partial removal was rarely advisable and barely scientific. He would deal only with proctotomy, which, of late, had been forced into prominence by the success of German operators. His own experience was limited to seven cases. One died in a few days; the remaining six obtained a varying amount of relief. All were still alive, one apparently well, at the end of twenty-one months; a second equally well at the end of seventeen months; a third had a speedy return of the disease, which now threatened to end fatally; two others were still well at the end of five months and twenty-six weeks respectively. In four of the cases the results had been almost all that could be desired, and incomparably better than those of the most exceptional colotomy. He had not yet attempted the removal of cancer when beyond the reach of the examining-finger, nor had he advised the operation in any male in whom the disease was seated in the anterior wall of the rectum. In thin, wasted patients access might be got to the disease by expanding the sphincter by a modified Weiss's dilator, but in stout persons it was necessary to cut from the rectum deeply down to the coccyx. Much of the success of the operation depended upon the thorough cleansing of the wound, not only at the time of the operation, but during many subsequent days. In cases in which the disease had originated beyond the reach of the finger, or had crept up to a higher level, he thought the operation unsuitable. He spoke next of colotomy. His opinion was that in cancer of the rectum, obstruction was not much to be feared if the disease were in the lower half, but was almost certain where the upper portions of the rectum are involved. Of fifty-four cases of colotomy taken from his note-book, performed for the relief of distress, and not for obstruction, three only died in the first month. Given the diagnosis of cancer high up in the rectum, the duty of the surgeon is to recommend without delay the formation of an artificial anus. As regards cases of disease affecting the middle and lower portions of the rectum, he found that the average duration of life in those who were not operated on was a little over seventeen months, while that of those who underwent colotomy was twenty-two months and a half. His experience had gradually raised his estimate of colotomy as a means of prolonging life. As regards relief of suffering, his conclusions were that operation lessens pain, diminished the desire to evacuate, prevented incontinence of fæces, and reduced the number of motions. He had hitherto only performed the lumbar operation, but he was favorably impressed by the evidence in favor of inguinal colotomy.

A NEW OPERATION FOR THE CURE OF INCONTINENCE OF URINE.

In the *Centralblatt für die Gesammte Therapie* for August, 1889, Dr. Gersuny reports the case of a girl, 14 years of age, who had suffered from incontinence of urine since birth, and who was cured by the following ingenious operation:

A crucial incision was made over the external orifice of the urethra, and through this the urethra was dissected free from the adjacent tissue up to the arch of the pubes. The urethra was then twisted on itself through a half circle, and stitched fast in its new position. As it was found that this degree of twisting did not produce relief, in two subsequent operations the procedure was repeated, until the urethra was twisted completely round through one and a quarter parts of a circle.

Four months after the operation the patient could retain her urine for five hours, and the cure was finally regarded as complete, with the single exception that the performance of the act was considerably slower than normal, three to four minutes being required to empty the bladder.

The author believes that such an operation will produce successful results in cases where the sphincter of the bladder is functionally inactive.

HOMERIANA IN TUBERCULOSIS.

This plant, which belongs to the family of Polygonaceæ, has been employed by LASKOFT (*Journal de Médecine de Paris*, August 4, 1889), with some success in the treatment of tuberculosis. This plant grows wild in Russia, and contains an acrid irritating oil, which appears to be its active principle.

The author has prescribed a decoction or infusion of this plant in affections of the respiratory passages, and especially in bronchitis and tuberculosis. He affirms that of one hundred and twelve cases of tuberculosis he has produced great improvement in ninety, the improvement consisting in the reduction of temperature, diminution of expectoration, while physical examination revealed retrogression of the pulmonary lesions in cases of advanced tuberculosis.

The author claims that this plant will reduce night-sweats, cough, and expectoration. He administers 1 ounce of the infusion or decoction of the homeriana, to be taken diluted in twenty-four hours.

ANTIPYRIN IN RENAL DISEASE.

In the *Lancet* for August 31, 1889, MR. M. H. FEENY reports the following case of Bright's disease, occurring in a married woman, aged 29. The patient had been in good health till two months previously. She was then seized with a diphtheritic sore throat, and was soon after ordered to Clevedon for change of air. On the journey she caught cold, dropsy quickly supervened, and she was admitted to the hospital on March 3. From this date till the following June the case was carefully nursed, and the routine *rôle* of medication was adopted. Still the malady made steady progress, and on June 14 the following condition was observed: There was extreme general dropsy,—the abdomen, face, and extremities distended, with dropsical effusion; great pain in the back, especially the lumbar region; intense headache; failing vision; heart action weak and irregular; difficulty of breathing, owing probably to a pushed-up diaphragm and pleural effusion; skin sallow, tense, and shining; urine scanty, of high specific gravity, and loaded with albumen; anæmia and general prostration. The condition of the eyes was very characteristic, the lower lids forming two distended translucent pouches. But the state of the ocular conjunctivæ was very striking. These were, to a large extent, raised from the sclerotic in transparent bladders of effusion, producing the condition called chemosis, and seriously endangering the circulation of the cornea.

Mr. Feeny then decided on testing the use of antipyrin, principally with the view of relieving the distressing headache, and ordered 3 grains twice a day, with strict injunctions to observe carefully the action of the heart. The need for this precaution was quickly demonstrated by increased irregularity, fainting, etc. On the third day the dose was reduced to 3 grains daily. From this date general amelioration of the symptoms was observed, and constant steady progress reported. After a few days a tonic supplemented this treatment, and in the course of three weeks a great change was observable; the dropsy was much less, the intense headache relieved, the appetite improved, and the patient much brighter and more hopeful. By the beginning of August she was up and about, visiting her friends. All traces of dropsy had disappeared, the general health was good, and there remained only a small quantity of albumen in the urine. On August 13 she was discharged for a convalescent home.

ACETO-TARTRATE OF ALUMINUM.

HOLSTE recommends this salt as being non-poisonous, and yet caustic, disinfectant, and antiseptic (*Revue Générale de Clinique et de Thérapeutique*, August 8, 1889). He has employed it as a light local irritant in various affections of the nasal fossæ, face, pharynx, and larynx. It is a powder which is soluble in water, insoluble in ether, alcohol, and glycerin, while a slight deposit forms sometimes in this aqueous solution. In contact with the mucous membrane, the salt produces within half a minute a superficial cauterization, accompanied by an effusion of serum. It may be used as a local application, mixed with an equal part of boric acid or some inert powder, or it may be applied on cotton, soaked with twenty to twenty-five per cent. solution in water.

The author claims that through its use he has obtained good results in treatment of nasal polypi, ozæna, and chronic hypertrophic

rhinitis. Applied to the nasal mucous membrane, it produces some coryza, headache, and momentary olfactory anæsthesia.

BROMOFORM IN WHOOPING-COUGH.

DR. STEPP, of Nürnburg, publishes in the *Deutsche Medizinische Wochenschrift* a large number of cases of whooping-cough, in which he claims to have obtained most satisfactory results from the internal administration of bromoform. The drug has, according to the author, no ill effect of any kind, and his numerous observations have proved that bromoform, as applied by him, is non-poisonous, and that the pulse and temperature remain unaffected by it. The action of bromoform is entirely different from that of bromide of potassium, as has been observed in epilepsy, the former being rather an excitant than a sedative. Children are ordered from five to twenty drops during the twenty-four hours in very frequent doses. The solubility of bromoform in water being very slight, the mixture requires the addition of alcohol. The author has administered bromoform in about sixty-five cases of whooping-cough, the children mostly ranging in age from 6 months to 7 years. The longest time required for a complete cure was four weeks. Symptoms of pulmonary catarrh in all these cases were entirely absent, or else they were very slight and soon disappeared. No complications existed in any of the cases observed by the author, but Dr. Goldschmidt has treated several serious cases of whooping-cough complicated with pneumonia, completely curing them in a fortnight by the daily administration of bromoform. Dr. Stepp concludes from his observations that under bromoform treatment bronchial catarrh and lobular pneumonia do not generally occur, and that where they exist at the commencement of the treatment, resolution takes place with facility and at an earlier period than under other methods of treatment. His observations showed also that the dose of bromoform must be in direct proportion to the severity of the affection and the age of the patient. The system does not seem to become accustomed to the drug, which has, moreover, considerable prophylactic power, so that the other children of a family in which whooping-cough in an advanced stage already exists can be shielded from the disease by being given bromoform. Dr. Stepp believes that bromoform is either excreted unaltered by the lungs or is separated into its elements, and that the free bromine is excreted by the lungs. In this way an effect on the bacilli of whooping-cough could be easily supposed to result.—*Lancet*, August 24, 1889.

Reviews.

THE MEDICAL AND SURGICAL HISTORY OF THE WAR OF THE REBELLION. Part III., Vol. I. Prepared under the direction of the Surgeon-General, United States Army, by Charles Smart, Major and Surgeon United States Army.

This great quarto volume completes, we believe, the medical and surgical history of the War of the Rebellion, a history whose growth has been prolonged over a period of nearly a quarter of a century, and has been marked by the death of two of its authors, men who will for all time rank high in the annals of the American medical profession during the present half-century.

Dr. Smart, called to take up this labor, found an immense mass of record to be digested, and found also that these records were in many cases incomplete, that they were observations upon common and well-known diseases, and that they were the records of methods, more or less, at present out of vogue, therefore more or less lacking in interest to the general profession. As an instance of this, take the subject of typhoid fever. The best treatment of typhoid fever during the war was that which confined itself to the regulation of food, the administration of stimulants, and occasionally a few drugs, to meet symptoms as they arose. Among these drugs it is interesting to find that turpentine held so prominent a place, and that there was almost a universal feeling in its favor. It may be asserted that this is due to the great personal influence of the late Dr. George B. Wood; but we think that the unanimity of opinion is a very strong evidence that the remedy is of value, being especially inclined to this belief by the fact that our own experience is very positive in this regard.

There are two conditions of the fever in which turpentine is invaluable. One state arises in the end of the second week, when the tongue is heavily glazed, and there is abdominal tenderness, and sometimes excessive diarrhœa. The second period is during the convalescence from the fever, when lack of digestive power and a general failure to make strength indicates the presence of the intestinal typhoid ulcerations. The reviewer

is firmly convinced that under each of these conditions the oil does good by acting locally upon the affected bowel.

If medical art had developed more early, or the war had developed more late, in the annals of time, the present volume would be much more interesting than it is. What opportunity was afforded, for instance, for a perfect testing of the frigorific treatment of typhoid?

Probably the most interesting portions of the book to the general non-military reader are those in which are discussed the development of diseases and various problems of preventive medicine. Thus, in regard to the origin of yellow fever, Surgeon F. H. Bache says: "Was the exemption from yellow fever due to quarantine or to the cleanly condition of the city, or to both? Following La Roche and others, I was not originally in favor of establishing a quarantine to keep out yellow fever. By originally I mean prior to the summer of 1862. My views were changing about that time, chiefly on account of the exemption of New Orleans from the disease during the summer of 1861. This I was inclined to attribute to our blockade, which was the strictest sort of a quarantine. During that summer the city was as dirty, if not dirtier, than usual, owing to the war; the ditches for artificial drainage were obstructed on our arrival. Moreover, the epidemic was 'overdue,' as they say."

The difference of disease in the white and colored races is very marked. Thus, the death-rate among the negroes from scurvy was nearly double that which existed among the white troops.

The most distressing page in the history of America is that connected with the treatment of the Union troops in the Confederate prisons. In the present volume the sickness and mortality among these troops, as well as the prevalence of disease among the Confederate troops in the United States prisons, is fully discussed. It seems to be established that, while the annual death-rate among the Confederate troops in the field was 4.4 per thousand, among the same troops in the United States prisons it was 5.2 per thousand. On the other hand, at Andersonville prison during six months seven thousand seven hundred and twelve deaths occurred among an average number of nineteen thousand four hundred and fifty-three Union soldiers, equalling an annual rate of 792.8 per thousand,—a death-rate which would produce the extinction of the whole mass of troops in about fifteen months. That this great death-rate was in great part preventable is shown by the fact that diarrhœa, dysentery, and scurvy occasioned three-fourths of the mortality,—scurvy, in the words of Dr. Smart, being "the chief executioner." In the records of the United States prisons the three diseases named have not occurred prominently as cause of death.

Time and space are wanting in which to dip more deeply and more frequently in the great volume that lies before us. We must, however, call attention to the discussion as to the cause of typhoid fever, as it seems to us fully shown that the disease may arrive *de novo*, without the importation of the germ from the human body. In conclusion, we congratulate Dr. Smart upon the completion of his great task, and place upon our bookshelves the cap-stone of the monument which has been erected through the liberality of Congress and the labors of the medical profession to the memory of a fratricidal strife, from the fortunate results of which the whole American people are reaping their great prosperity.

INEBRIETY; ITS ETIOLOGY, PATHOLOGY, TREATMENT, AND JURISPRUDENCE. By Norman Kerr, M.D., F.L.S., etc. Second edition.
London: H. K. Lewis, 136 Gower Street, W. C., 1889.

The world is filled with inebriety. Social order, comfort, and decency are all outraged by it. Yet the world continues still to deal with it in a half-hearted, utterly mistaken way, based upon certain theories that it holds, which were long ago disproved. Either the inebriate is repressed by legislation, or the offending substance—alcohol—is limited or proscribed, with all who deal in it, while sound medical science asks in vain for an opportunity to prove the truth of its theory and the wisdom of its plan. For the inebriate, in the true sense of the term, not the roysterer or the convivial drinker, but the being who makes most of the social disorder, who furnishes the "horrid example," who is so brilliant when sober, such a wreck when drunk, who pledges and promises, and returns to his "wallowing in the mire," is the subject, either by his own course of life, or by direct or indirect inheritance, of definite, real, physical disease, and as such demands of society the opportunity and means of cure. Imprisonment will not cure him, penal enactments will not prevent his ancestors from having given him a neurotic constitution. We must build up rather than weigh down, and this is fully recognized by the medical profession. Yet

the law only here and there makes it possible to carry on any systematic treatment. He is far worse off than the acknowledged lunatic, or those who are manifestly sick. Yet he suffers as often for the sins of the past and the social sins of the present, as the typhoid case or the tuberculous one.

Should any one doubt this, we are convinced that a study of the facts, statistics, and arguments of Dr. Kerr, as presented in this work, will convince him, if capable of being reached by any facts; in short, if he be not suffering from the neurosis of fanaticism, which also, far oftener than we imagine, is a direct inheritance from a by no means lofty source. The same strain to a remarkable degree runs through the constitution and mental character of the inebriate and fanatic. The same inherited taint that makes one succumb to alcohol leads the other to fight it, rationally or irrationally, with a blind yet desperate instinct against it, just as powerful and as unexpected as the inebriate's mad craving for it. Fortunately, perhaps for us, the children of the mentally unstable, the physically exhausted, may furnish the two extremes, the social bane and social antidote,—the sot and the temperance zealot,—who scorns all by-roads, all expediency, and demands the radical remedy,—the removal of all alcohol. Let the arts suffer, let the sick perish, alcohol, in his opinion, is always useless, always deadly. No arguments move him, no considerations divert him from his radical course. But he forgets that the craving and depression, the weak will, and the demand for so-called stimulants of some kind, existed before the supply, and will exist after its abolition; that the real inebriate has many resources; that when his main reliance cannot be obtained, though for a short time, he may pause, yet soon some other agent, be it opium or chloral, the bromides, or even other drugs, which we consider blessings in their moderate use, will take its place, and be used to satisfy the same inordinate appetite.

Dr. Norman Kerr has given us a strong plea in this book for such legislation as will make possible the cure of the inebriate. He has looked up all the legislation of recent years in Europe and America, and one can see how half-hearted it is where it exists, and in how many places, alas! there is no provision by which the inebriate can be restrained at all. Even where the law gives the power to establish suitably supervised inebriate sanitariums, the time during which restraint can be exercised is far too short to effect a cure. The bad work of years, to say nothing of past generations, cannot be undone in a few weeks or months. England has, of late, obtained some enactments, good as far as they go; but the United States is woefully deficient in anything of the kind. And, even with useful laws on the subject, public sentiment needs educating up to the point where it will realize their value as well as their necessity. To this task Dr. Kerr's work is principally addressed, and we trust it will open the eyes of many readers to the real facts of the case. E. W. W.

Correspondence.

PARIS.

(From our Special Correspondent.)

The Absinthe Controversy—Mme. Marie Huot—Thallin losing Favor—Cocaine as a Local Anæsthetic—Fire in the School of Medicine—Iodoform Elimination.

The absinthe controversy is still going on. Last month, it will probably be remembered, Drs. Cadéac and Meunier presented to the Academy of Medicine an elaborate memoir, wherein they denied the poisonous properties generally attributed to oil of wormwood, and concluded in charging oil of anise seed with all the accidents befalling absinthe drunkards. To support their views, they quoted a considerable number of experiments, both on men and animals, the results of which were briefly related in the last number of the THERAPEUTIC GAZETTE. Owing to the importance of the subject, and the subversive, not to say revolutionary, nature of the conclusions,—in a medical sense,—the memoir was referred by the Academy of Medicine to a committee, headed by Dr. Laborde, with instructions to investigate the matter. At the sitting on October 1 he read the committee's report, which is in direct opposition to the memoir's conclusions. As a decisive refutation, Dr. Laborde proceeded to perform before the Academy a comparative experiment on two guinea-pigs, twin brothers and exactly alike in weight, with 1 cubic centimetre (16 minims) of oil of wormwood on one side and the same quantity of anise on the other. As the first animal was soon taken with convulsive and epileptiform symptoms, which ended in death within an hour, while the second only remained sleepy and curled up in a corner, Dr. Laborde considered it a proof of the doctrines hitherto gen-

erally accepted respecting oil of wormwood. To explain the strange benignity observed by Drs. Cadéac and Meunier, he suggested they had been operating, not with the true oil of wormwood, but with some Algerian variety or substitute which is probably far less poisonous. Finally, he presented to the Academy the following conclusions: 1. Oil of wormwood is the poisonous ingredient of the compound cordial or bitter known as absinthe. 2. It is a dangerous error to give the name of beneficent and corrective to the fundamental principle imparting to absinthe both its name and dangerous properties. 3. Absinthe, like similar bitters, such as vermouth, etc., made with low-grade spirits, are by nature unwholesome, and dangerous to public health. 4. The term "absinthism" is, and should remain, characteristic of this deleterious effect, which, together with the toxic action of alcohol, "alcoholism," constitutes the two great plagues of public health, against which on our part war should never cease. The report's conclusions were unanimously adopted by the Academy with loud cheering. Yet our period is one of irreverence. Notwithstanding the decree of so august an authority as the Academy of Medicine, more than one scientist finds fault with Dr. Laborde's reasoning. Pharmacologists blame him for assuming Drs. Cadéac and Meunier's oil of wormwood to be bad and Algerian, and his own the genuine and pure stuff. Some chemical analysis, or examination at least, was an indispensable preliminary to all physiological experiments. For that matter the three doctors fare pretty much alike in their estimation. When Drs. Cadéac and Meunier say they made experiments with star anise oil, how did they know the product contained none of the poisonous oil of the *Illicium religiosum*? The fraud is a common one nowadays. The whole argument, for or against, is built on sand, and amounts to nothing. On the other hand, some physiologists merely chuckle, and say the guinea-pig experiment proves nothing, as the oils were introduced hypodermically, and the absinthe drunkard does not take his that way; besides, they add in a whisper, he is another sort of pig. But this is not all. As you know, in Paris there is always a funny side to every question. At the Academy sitting, when Dr. Laborde began to operate on the guinea-pigs, a lady in the audience suddenly rose, and began a vehement speech against such useless cruelty to innocent animals. Some cheered her, others protested, and many laughed, but such a disturbance ensued that the proceedings had to be suspended and two ushers sent to politely request the lady to leave, which she did with flying colors. After the little incident, the academicians, now used to her interruptions, went on with business. The fact is, she is quite a Parisian character, Mme. Louise Huot by name, a rather good-looking brunette, wealthy, and always most tastefully attired, whom no one would take to be the mother of a big whiskered young man, a head taller than herself. She is the president of some sort of an anti-vivisection society, the offshoot of the well-known British association, and never loses an occasion to publicly protest against the doctors' cruelty. On the occasion of the unveiling of Claude Bernard's statute she loudly hissed. At a College de France lecture she broke her umbrella over the head of the cruel lecturer, who was going to experiment on a live monkey. At a pro-Pasteur meeting she raised such a disturbance that gallant old De Lesseps, whom she had bitterly denounced for presiding, had to protect her out,—Panama had not failed then,—and escort her to her carriage. More recently, at the Alfort School, during a meeting of veterinarians, she almost rammed her legendary parasol down the throat of a professor who was proceeding to investigate an innocent hen. Her exploits are legion. But on the present occasion it must be conceded she was not wrong altogether. Dr. Laborde's experiment on guinea-pigs was of questionable usefulness, and quite out of place at a public sitting. However it may be, Mme. Huot is generally respected, and rather liked by Parisians, who could not spare her for the world. At the Therapeutic Congress she was present at most of the meetings, but found nothing to reprehend, much to the disappointment of foreign members, who, on seeing her, expected some amusing incident.

Speaking of organic poisons, for such they now seem to consider thallin, the once lauded medicament is daily losing ground in France. Dr. Albert Robin, of the Academy of Medicine, having observed that thallin will decrease general disassimilation, and especially that of albuminoids, increase the loss of sulphur and phosphorus-containing constituents, diminish the uric-acid excretion without lowering its formation, and interfere but little with noxious intestinal fermentations, has given it as his opinion that thallin is a poison of the blood globules, nervous system, and, in general, of all the tissues rich in sulphur and

phosphorus; it is a false and dangerous antipyretic, contraindicated in uræmic, arthritic, and nephritic affections, and its prolonged use will finally lead to anæmia and nervous debility.

Cocaine as an anæsthetic is another much-controverted therapeutic agent. Until some generally-accepted opinion has been arrived at, it is of interest to know what prominent surgeons think of the substance, and what has been their experience with it. At the Congress of French Surgeons recently held in Paris, and attended by many foreign doctors, who were warmly welcomed, Dr. Reclus highly spoke in favor of cocaine. He considers it a valuable anæsthetic not sufficiently appreciated, because its handling is not always well understood. "Cocaine," he said, "is applied both in lotions and hypodermic injections. The first mode is in many cases insufficient to produce lasting anæsthesia; yet I found them often serviceable when dilating the anal sphincter, or washing articular cavities with strong carbolic acid solutions. But the chief way is by means of injections into the tissues. Some say that cocaine is useless, others that it is dangerous. In my opinion both assertions are wrong, as I have up to this day performed more than seven hundred operations with the help of cocaine as an anæsthetic, and I never failed to obtain with it full analgesis, lasting for three-quarters of an hour, and sometimes a whole hour. One exception, however, should be noted: with bones analgesis is, if not impossible, at least exceedingly difficult. With tissues, normal or inflamed, the following precautions should be employed: The needle is first pushed into the derm, a few drops of the two per cent. solution being injected at the same time. It is, next, slowly introduced deeper in, while the injection is kept up at the same rate. In this manner, with a single syringeful, representing 20 centigrammes (3 grains), a quantity which need never be exceeded, an analgesic zone of two centimetres (four-fifths of an inch) in diameter is invariably obtained. The incision, which may be made with either the bistoury or the thermo-cautery, should be practised in the centre of the zone. Only, when the cautery is used, the operation is to be completed with one stroke, as heat seems to destroy cocaine, and a second incision would be painful. As regards the danger apprehended by some, no fear need be entertained, since no death from the alkaloid ever occurred with doses inferior to 75 centigrammes (12 grains). Besides, by this procedure, any vein accidentally met with would come in for a very small quantity of the solution."

While on the subject of the Surgical Congress, it may here be mentioned that, on the second day (October 8), just as the morning sitting was going to adjourn, the Paris Faculty's grand amphitheatre, where the surgeons met, caught fire from a defective heater. The members beat a hasty retreat, and made room for the firemen, who soon subdued the flames, a comparatively easy matter with Paris buildings, all made of solid blocks of stone, and no wood to speak of besides the furniture. Nevertheless, the damage done has been estimated at seventy thousand francs (fourteen thousand dollars), including three large paintings by Matout. The most important, sixteen by thirty-one feet, representing good old Ambroise Paré performing the first arterial ligature after amputation, was valued at four thousand dollars; the two smaller side pictures, illustrating hospital scenes, sixteen hundred dollars each. A marble bust of Hippocrat fell down, and was broken to pieces. The rest was mere material damage to wood-work and furniture. He knows Paris but little, however, who thinks a congress would come to an end because the meeting-place has burned down. The same afternoon our surgeons were provided with a better hall, just across the way, in the unfinished École Pratique. They were given the main amphitheatre, hitherto unused, twice as large as the one just cremated, and more convenient every way; and, better still, they inaugurated the new place without official speeches.

The elimination of iodoform has hitherto remained a disputed point, some holding it to pass unaltered through the kidneys, others maintaining it is in the economy oxidized into various iodides, and voided as such. This month, at a meeting of the Society of Practical Medicine, Dr. Choay gave it as the result of his investigations on a number of cases, that iodoform, when administered in any shape, always passes off as an iodide. To ascertain the fact he would shake the urine with ether, and on evaporating the solvent, never observe any trace of iodoform, while on operating in the same manner with a specimen containing 1 in 10,000 of iodoform, purposely added, the characteristic hexagonal plates could easily be identified under the microscope. On the other hand, in the urine of all the patients the presence of iodides could readily be detected. To which Dr.

Gautrelet replied the reason why opinions differ is because iodoform is sometimes decomposed in the economy, sometimes not. With patients like the arthritic, with urines more acid than in the normal state, oxidations are slow, and iodoform will be found unaltered; while with patients like the typhoid or the tuberculous, where oxidations are exaggerated and the urine acidity below the normal point, iodoform will entirely be burnt into iodides. This plausible explanation suggests a new and delicate mode of diagnosis for obscure affections.

PARIS, October 19, 1889.

LONDON.

(From our Special Correspondent.)

As a sign of the change which is coming over the study of therapeutics may be instanced the lectures given this year by Dr. Lauder Brunton before the Royal College of Physicians. It was at one time common to look almost with contempt at the investigation of the physiological action of a drug with a view to the treatment of disease. Such ideas are, however, fortunately, passing away; and they must do so, since the study of pharmacology has enriched medical art with so many useful drugs. Our forefathers were content to get their remedies from natural products; and, at the present day, we cannot afford to despise this source of drugs, for have we not received in this way quinine, morphine, salicin, and cocaine? But the modern pharmacology has introduced into medicine substances manufactured in the chemical laboratory, the supply of which is constant. Dr. Brunton's lectures dealt chiefly with the physiological action and chemical structure of such substances. Many of the results of the experiments of various observers which he mentioned may not be found to be of permanent value, but they indicate the direction in which the study of remedies is tending. We know a good deal now of the microscopical structure of the tissues, both in health and disease, and we are getting clearer ideas of the physiological and pathological functions of these tissues and organs. But there is very little known of the intimate changes occurring in tissues, and these changes are chiefly chemical. Modern pharmacology, instead of limiting its study to the general effect of drugs on the body and on separate systems (the circulation, etc.), is busying itself with the difficult and obscure subject of the action of drugs on tissues,—on the cell. Thus, as Dr. Brunton says, we are now investigating the pharmacology of the cell. Whether any practical result will come to medicine from such a study is impossible to assert. It can only be said that the knowledge that any particular chemical substance selects in its physiological action a certain tissue in a particular way, such as that of stimulation, etc., may be of service in indicating the use of that substance as a therapeutic agent when the tissue on which it acts is diseased. At the present time, however, this must be considered a somewhat utopian idea, and the practice of medicine is to a large extent empirical.

It is not only new drugs which are claiming attention; but it is evident that practitioners are beginning to recognize that very little is really known of old drugs,—those handed down from previous generations and now constantly in use. We might take as an example the spirits of nitrous ether. This is supposed to be, according to the British Pharmacopœia, a preparation containing alcohol, "nitrous compound, aldehyd, or other substances." The chief nitrous compound present is the nitrite of ethyl; but, as is now well known, the preparation is very uncertain in its strength. Professor Lusk, of Manchester, has shown that recent specimens of the preparation may contain two per cent. or more of the nitrite of ethyl, but old specimens may contain as little as a half per cent. Moreover, poor nitrous acid is present. It is obvious that a pharmaceutical preparation with such a varying composition would give very varied therapeutical results; and this is, no doubt, the case. Instead of it, Dr. Lusk suggests a three per cent. solution of the pure nitrite of ethyl in alcohol, instead of spiritus ætheris nitrosi. The dose of the solution is from ½ to 1 drachm. It is now a stock preparation constantly used in the Royal Infirmary at Manchester, and undoubtedly is very useful. It is of special service in cases of difficulty of breathing, due to disease of the heart or to bronchitis,—that is, in the so-called cardiac and bronchitic forms of asthma. In these cases the practitioner is often nonplussed as to what to give, and the solution of nitrite of ethyl may, therefore, be tried. No bad effect has been noticed with the solution in drachm doses; but it must always be remembered that nitrite of ethyl has the general effect of the nitrites in producing dilatation of vessels and a sense of fulness in the head. The solution has the disadvantage of

decomposing when prescribed with water, and it ought, therefore, to be mixed just before taking. This is, no doubt, a disadvantage. A drachm is written on the prescription, to be taken, perhaps, three times a day, and the chemist writes on the label a measured teaspoonful to be taken. This is the usual custom. Our ancestors may have had teaspoons holding only sixty minims, but the modern teaspoons certainly hold one hundred minims or more. A patient, therefore, who is ordered a drachm of solution of ethyl nitrite three times daily will take three teaspoonfuls, measuring altogether five drachms of the preparation. With potent drugs this is an important fact to bear in mind, especially as patients are often careless as to the amount of medicine they take, and are not likely to diminish the second dose if the first "does them good."

The British Medical Association moves with the times, and has this year made a grant of money to its therapeutical committee for carrying on pharmacological and therapeutical research. This committee, which owes its existence to Dr. Whitla's, of Belfast, suggestion, includes most of the leading therapeutists in Britain. The object of the committee is to obtain the results of the trial of drugs by practitioners in different parts of the town and country, so as to gain accurate information respecting them. The subject which the committee have taken up this year is that of hypnotics, chiefly those introduced during the last few years; and, by having the results of this trial of the drugs recorded in a uniform manner, the committee hope to obtain definite information as regards the utility of this valuable class of drugs. Whether their hope is a vain one or not, remains to be seen; but the experiment seems worth trying. It is not, of course, every one who does observe and record accurately; but there are few people, who, if they have the patience, cannot learn to be accurate observers. The committee do not propose to collect observations indiscriminately; but they will establish centres of observations in different parts of the kingdom, and the member of the committee (generally the professor at the neighboring college) will personally supervise the recording of the observations, or rather will be answerable for the scientific quality of his observers. There is no doubt that, if the scheme works well, a large mass of facts will be obtained, which will, perhaps, be serviceable in the therapeutical application of the drugs.

A NEW METHOD FOR LOCAL TREATMENT OF THE LARYNX.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Owing to the prevalence of laryngeal diphtheria (membranous croup) in this vicinity and the futility of all treatment, I have concluded to present a new method of treatment, which, I think, is original with me. I have reason to believe it to be new and original, for I cannot find an account of a similar method after diligent research in all works treating the subject of diphtheria. Not having tested my proposed method as yet, and owing to its heroical tendencies, I thought it best to lay it before the readers of the THERAPEUTIC GAZETTE, thus giving the older and more experienced members of the profession an opportunity to judge as to its merits or demerits, hoping thus to receive an honest approval or a fair criticism of the proposed method.

This proposed new method consists in nothing more or less than a direct medication of the interior of the larynx by a variety of solvents to the diphtheritic membrane, not applied through the medium of a tracheotomy tube, or the appliances of the intubation method, but by means of a special needle and canula attached to a hypodermic syringe, this needle and canula being used to penetrate the larynx direct from without through the crico-thyroid depression and membrane.

The needle used for this purpose should be fitted accurately to the hypodermic syringe; it should be short and of a larger calibre than those ordinarily used, and somewhat stronger and very pointed, and have sharpened edges to facilitate its passage through the cartilaginous structures of the larynx. The canula to this needle should be made of some non-corrosive material (silver), should fit the needle closely, and be provided with a shield at its upper extremity, having a perforation on both sides, to serve as eyelets, to which stout silk threads can be attached for the purpose of retaining the canula *in situ* after having been once introduced, thus enabling the operator to make repeated injections of solvents, without necessitating a fresh puncture of the larynx every time. The point of puncture, in my opinion, is best made, as stated before, through the crico-thyroid depression and membrane. It should be made at the lowest part of this depression, and a little to the right side of the median line, to avoid puncturing the crico-thyroid artery. The needle should be slightly

slanted upward during its introduction, so that it would reach the interior of the larynx, but it should not be pushed up too high for fear of injuring the vocal cords.

The position of the patient should be on the back during the time of the puncture, with the head well depressed; in fact, it would be better to elevate the hips and inferior extremities during the entire treatment by this method, for the reason that by this the gravitation of the injected fluids would be towards the chink of the glottis, thus favoring expulsion of the detached membrane and mucus, instead of passing downward into the trachea. Occasional turning over, with face downward, in this position, would be favorable, in order to relieve the patient of a position which becomes irksome after some time, and also to favor better expulsion of loosened fragments of membrane. The injected solvents would also by this change of position reach every part of the larynx, which is very desirable; in fact, necessary. The best time to make these injections of solvents is undoubtedly during the stenotic stage (second stage). The injection should be repeated three or four times during every twenty-four hours, until no false membrane is renewed, or until convalescence is surely established. The canula may then be removed, and the minute opening closed with a piece of adhesive plaster; all traces of the puncture will disappear in a short time. The solvents most appropriate to be used in this method of treatment are, in my opinion, solutions of papain, or pepsin, or lactic acid, in a menstruum of pure, or nearly pure, glycerin. Sufficient muriate of cocaine should also be added to solutions of any of the solvents to average four or five per cent. in strength. From 5 to 10 minims of the solutions of solvents might be injected at a time without detriment, I think. The use of glycerin as a menstruum is not alone on account of its solvent properties, but also on account of its viscidity, this favoring adhesion of the solvents to the false membrane, and preventing to a great extent too much gravitation of the injected fluid. The cocaine is added to overcome the irritability of the larynx caused by the first injection and to lessen the pain subsequent to the puncture, also to prevent the irritation of repeated injections, and to lessen and prevent the spasmodic closure of the glottis interfering with the extrusion of detached pieces of false membrane. Of solvents proper, I consider papain and pepsin the best. They should be used in such strength as to effect their purpose,—*i.e.*, that of dissolving and detaching the diphtheritic membrane.

In conclusion, I will say that I consider *puncture of the larynx* worthy of a trial and of deserving a place as a remedial measure in the treatment of laryngeal diphtheria or membranous croup. It is not difficult to perform, nor is it a "*dernier ressort*" as tracheotomy, easier to effect than intubation of the larynx, does not interfere with other plans of treatment, and in taking nourishment, as intubation of the larynx does. The instruments for its performance are not expensive nor bulky, and can and should be carried in the hypodermic-case of every physician at any and all times, as well as the solvent solutions, so that he may be ready for an emergency at any time and at any place.

I hope that I may receive a frank opinion as to the advisability or non-advisability of my proposed method. Of course, it is evident that this plan is suitable for laryngeal treatment in all cases where local medication is required.

I remain, respectfully yours,

ERNST ZIMMERMANN, M.D.

BATESVILLE, IND.

A CRUCIAL TEST OF CUPRIC ARSENITE.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—For the satisfaction and encouragement of a large number of readers of the GAZETTE who favored me with communications in reply to my paper, which appeared in the July number, upon "Arsenite of Copper as a Remedial Agent," I beg leave here to submit for their consideration an instance of its use, which may be accepted as a crucial test. While I am not disposed to claim for this preparation unusual powers, it is not too much to assert that in the majority of cases such as I have indicated it will prove efficient. Like many other remedies, it has certain limitations, but when I have been able to collate the experience of others, who are now giving the matter attention, I may be able to outline more precisely the indications for its application.

The circumstances attending its use in this particular case are about as follows: One of my patients, who lately visited the country for a brief sojourn, was so fortunate as to have a supply of the tablets, each containing the one-hundredth grain of the drug, and, along with others in the house, suffered during the night from a severe attack of cholera morbus, brought on, doubtless, from indiscretions in

diet and changes in the weather. In the early morning it was found that no less than four of the family were suffering from the same complaint,—three adults, and one child 6 years of age,—but not until then did it occur to them that any remedy was at hand. After breakfast a consultation was held, the result being that three of the tablets were dissolved in water according to the directions I had given, and, although at the time of beginning treatment, the disease had shown no signs of abatement, yet, in the course of an hour, all of them expressed themselves as feeling greatly improved. At dinner-time there was a general consensus of opinion that they were well enough to undertake a pleasure-trip into the country, a distance of ten miles, as had been previously arranged. Fortunately, no difficulty was experienced on the route, and the jollification was such that they all freely indulged in ice-cream and cake before returning home, which, to say the least, was rather an unwise proceeding, considering the interruption of the functions of the alimentary tract. Without an exception, however, they returned in the evening free from any discomfort, in excellent spirits, and with good appetites for supper, which they took no precaution to stint, and, strange to say, none of them suffered any inconvenience whatever thereafter.

Such attacks, as above described, I have frequently witnessed during the past year, and, as a rule, they have been followed by equally happy terminations, and I bespeak for this new remedy a careful investigation on the part of my brethren in the field, believing they will find it an acceptable addition to our resources for the relief of affections which are often stubborn, and, when not nipped in the bud, are sometimes alarming.

In this connection I would like to mention that one of my patients is engaged in farming, and lately having a calf a few weeks old, which had become greatly emaciated from what is known as "scours," he decided, after many other remedies had failed, that he would try the arsenite of copper, giving the whole of one tablet at a single dose, by dissolving it in the milk when the animal was fed in the morning. Now, whether it was hypnotism, suggestion, mesmerism, metallo-therapy, transference, or what not, that calf had no "scours" from that time forward, and had no further treatment.

In conclusion, I may add that the matter of supplying samples became quite burdensome, so great was the demand, but I beg to say that I secured the kind offices of Messrs. Parke, Davis & Co., who have placed the tablets on their list, and will send samples to those who may wish to investigate further the clinical value of this remedy. Those who have already had an opportunity of observing its effects will confer a favor by advising me of the results at their convenience, with a view to securing the combined experience of different observers in various sections of the country.

JOHN AULDE, M.D.
4719 FRANKFORD AVENUE,
PHILADELPHIA.

ARSENITE OF COPPER IN CHOLERA MORBUS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I wish to report the following cases treated with arsenite of copper:

CASE I.—T. H. Stewart (myself), 62 years old; bilious, nervous temperament; subject to cholera morbus once or twice a year. On the — day of August last, at 2 A.M., cholera morbus set in with great violence, and continued growing worse until 5 A.M., when I began to take arsenite of copper, as directed by Dr. John Aulde, of Philadelphia,—viz.: Dissolve a tablet containing one-hundredth of a grain in from four to six ounces of soft water, and take a teaspoonful every ten minutes for one hour, then every hour. I thought I was better one minute or so after the first dose. I knew I was better after the second dose, and when six doses had been taken, and one hour passed, all that swelling of stomach and bowels, and sickening, deathly pain, and agonizing tormina, and tenesmus at every stool, which were frequent, was gone. A very serene feeling came over me. I thought I would sleep till the first every-hour dose came; but lo! I slept uninterruptedly and most refreshingly for five hours. I awoke feeling quite well, except that I had no appetite, and resumed the treatment for the balance of that day.

CASE II.—Miss J. W. Stewart (my daughter), 22 years old; of nervous temperament; has occasional spells of indigestion. The last spell, which occurred in August, was marked by entire loss of appetite, sick stomach, and diarrhœa, with constant uneasiness in stomach and bowels. I requested her to note every sensation and change which might follow the first dose of the arsenite, and then

commenced giving it to her. She said she felt better after two or three doses were taken. The diarrhœa was arrested at once. The next meal she had a fair appetite. She continued the treatment for two days, and is now, after eight or ten days, quite well.

I ought to have said that very frequent eructations of a metallic taste occurred with myself during the first hour.

THOS. H. STEWART.

DIXIE, GA.

THE POISONOUS PROPERTIES OF CHROMIC ACID AS A CAUTERY.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—A few days since I happened to get some of the back numbers of the THERAPEUTIC GAZETTE, and am not a little surprised to find in the July number, in the concluding lines of an article entitled "The Toxic Action of Chromic Acid as a Cauterant," and reported by Dr. J. William White (presumably Professor White), the following sentences: "The sudden death in this case, the author continued, was surprising, as the text-books contain no word of warning against the dangers of using chromic acid, while recommending its employment. Gubler, however, in the *Gazette Méd. de Paris*, 1871, had said that the absorption of chromic acid was not free from danger, and patients had been poisoned by a too extensive application to the surface of their bodies."

By the way, chromic acid and its allied salts are not only poisonous, but very poisonous.

It appears that chromic acid was used before by Professor White, apparently with nothing to indicate the need of caution. Perhaps Gubler's sentence is or was taken as conveying the idea that the external application of chromic acid is only poisonous, and not sometimes fatal.

It also seems that in this case no antidote was given, but simply an expectant treatment adopted, as the nature of the sudden sickness appears to have been a mystery.

True, some of the text-books contain no word of warning. Still, it may be interesting to review the toxicology of chromic acid in its outward application. This I have done with the literature at my command. As will be noticed, it contains most of the German works on materia medica and toxicology, fewer English and American authors. Nothing in regard to its toxicology is to be found in Schmiedeberg (*Grundriss der Arzneimittellehre*, 1883); Ewald (*Handbuch der allgem. und speciellen Arzneiverordnungslehre*, 1887, 10, Aufl.); V. Ziemssen (*Handbuch d. speciell. Pathologie und Therapie*, Band. xv., Intoxicationen, 1880): Hugo Schulz (*Grundriss der praktischen Arzneimittellehre*, 1888); Geissler and Möller (*Encyclopœdie der gesammten Pharmacie*, 1886); Bartholow ("Treatise on Materia Medica," 6th and 7th edit., 1888, 1889); Röll (*Lehrbuch der Arzneimittellehre für Thierärzte*, 1880); Roth (*Die Arzneimittel der heutigen Medicin*, 5, Aufl., 1886); Stillé and Maisch ("Nation. Dispensat.," 4th edit., 1887); in Liebreich and Langgaard (*Compendium der Arzneiverordnung*, 1887); and Ringer ("Handbook of Therapeutics," 12th ed., 1889) nothing new, except that the latter says: Mr. John Marshall uses lead lotion immediately after. From Maschka (*Handbuch der gerichtlichen Medicin*, Bd. ii., 1882) we do not learn much, except that he mentions a case of poisoning, p. 112; Baer ("Vergiftung durch Cromsäure," in *Phila. Med. and Surg. Rep.*, xx. 19, p. 362, 1869); Bing (*Vorlesungen über Pharmakologie*, 1884, 1886) only mentions its physical properties. The U. S. Dispensatory also mentions Gubler's reports of the year 1871.

The following citations give the most information as to the effects of the external application of chromic acid:

Harnack-Buelheim (*Lehrbuch der Arzneimittellehre v. Arzneiverordnungslehre*, 1883), says of chromic acid, p. 115: "The general impression is that externally applied this substance causes less pain than other caustics, but yet its action may be extremely violent, and should, therefore, be carefully watched."

Böhm (*Lehrbuch der allgem. u. speciellen Arzneiverordnungslehre*, 1884), says on page 109: "The possibility of poisoning from absorption of chromic acid should be remembered. The application should be limited to small surfaces, and its effects should be carefully watched."

Nothnagel and Rossbach (*Handbuch der Arzneimittellehre*, 1884, 1887) say, on p. 346: "In addition, symptoms of general poisoning may likewise follow the external application of chromic acid in man,—a metallic taste in the mouth, peculiar odor, vomiting, diarrhœa, and profound collapse" (Mosetig and Bruck).

Bernatzik and Vogl (*Lehrbuch der Arzneimittellehre*, 1886) speak in a similar strain: "Even its external application should be watched with the greatest care, on account

of the danger of its ready absorption. Violent vomiting, diarrhœa, collapse, and even death, and violent choleraic symptoms have frequently been observed to follow the external use of chromic acid as a cautery" (A. Mayer, Bruck, Mosetig, and others).

Lewin (*Lehrbuch der Toxicologie*, 1885) says: "Absorption may also take place on the surface of wounds and over the surface of the skin."

Vogel (*Specielle Arzneimittellehre für Thierärzte*, 1886, p. 500) says: "Caution must always be observed against its great poisonness, even when diluted."

Kobert (*Comp. der prakt. Toxicologie*, 1887) says, p. 65: "Unfortunately, it is always absorbed, and so may produce general symptoms of intoxication, which especially affect the kidneys and large intestine."

Hager (*Handbuch der Pharmaceut. Praxis*, 1880) gives a full history of a case as follows: "Von Mosetig reports in the *Jahresber. d. K. K. Krankenhauses* a case of poisoning with chromic acid with fatal issue. The case was one of medullary carcinoma of the left breast, in a woman 39 years of age, which was cauterized with chromic acid, with the hope of arresting the rapid icherous discharge, which was then taking place. On the following night numerous symptoms of poisoning occurred (vomiting, abdominal pain, etc.). Death resulted on the following morning. Mosetig had already noted the occurrence of vomiting after the use of chromic acid as a cautery, but had attributed it to the employment of chloroform. The above case, however, seems clearly to show that the vomiting was the result of the application of the chromic acid. Chromic acid should, therefore, never be employed but with great caution."

This case very closely resembles the one related by Professor White. Finally, a case of poisoning, in which, however, recovery took place, is also to be found in the *Therapeutische Monatshefte* for August, 1888, p. 323.

Very respectfully yours,

WM. WEBER.

PITTSTON, PA., September 9, 1889.

GELSEMIUM SEMPERVIRENS—OBSERVATION ON ITS USES.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Noticing the inquiry of Dr. Wharton Sinkler, of Philadelphia, in the June number of the GAZETTE, I see that many members of the profession have given little attention to the therapy of this valuable agent; hence I have concluded to jot down for the consideration of the busy practitioner a few of my own observations of its merits and applications.

It may be true that one drachm of the fluid extract of gelsemium proved fatal in one case reported. It is, however, far less toxic than many other agents in general daily use; but still the toxic bugbear seems to continue to strangle its reputation.

Close observation and careful investigation are often necessary to distinguish the effects of disease from the effects of medicine. Medicine is often indicted when disease gave the blow. A remedy may be given and the patient recover, but it requires many duplications of the treatment to decide whether it was *post hoc* or *propter hoc*.

Years ago, in order to become more fully acquainted with the physiological effects of gelsemium, I commenced, in experimentation upon myself, with 5 drops t. i. d. of the fluid extract, increasing one drop every day until fifteen were taken t. i. d., feeling no effects until the evening of the day of the large doses, when a very peculiar sensation of the eyes supervened and drooping of the lids; the agent was then suspended.

In reply to Dr. Sinkler's query, I will say that I do not consider, nor is, a single dose of 15 or 20 drops for an adult dangerous to life.

When administering gelsemium we must keep in mind its tendency in large doses to paralyze the motor and sensory ganglia, and also that it produces death by paralysis of respiration.

Professor Roberts Bartholow says ("Materia Medica and Therapeutics") that "Opium, when given with gelsemium, increases its effects in the whole sphere of its physiological activity." Yet, notwithstanding the *ipse dixit* of this distinguished physician, I have found it to be an *antidote*, and give it to antagonize the toxic effects of opium. Here hangs an important question to be decided by experimentation of learned physiologists, Is gelsemium an antidote to opium?

In conclusion, three years ago I was called to see an Irish servant-girl, aged 20, in whose case hysteria so completely simulated acute peritonitis as to thoroughly deceive me for the space of several hours to relieve the pain, vociferously complained of. Morphine was freely administered hypodermically, but without effect; it utterly failed to relieve. Finally, becoming apprehensive of the toxic properties

of the drug, I made a digital vaginal examination, which at once revealed the true character of the girl's trouble. Now, here was a case presenting two indications to be met promptly. First, to prevent narcosis; second, to overcome the hysterical paroxysm. Fortunately, a single remedy could meet both indications,—an antidote to morphine and a remedy for hysteria. I accordingly administered 20 minims of the fluid extract of gelsemium hypodermically, followed promptly by relief, and the girl passed a comfortable night, and was equal to her household duties next day.

The intoxicating effects of a large hypodermic of morphine—so alarming to friends of patient—may readily be controlled by a proportional hypodermic of gelsemium, which I consider the best known antidote.

I reported my experience of its antidotal properties in the GAZETTE, June, 1887, page 429. Subsequent experience with the drug has not altered my opinion.

Strychnine hypodermically administered is one of the best adjuvants, and is a wonderful prompter of respiratory energy, and should be used in that capacity when gelsemium has nearly overcome the narcosis.

In treating a case of profound opium narcosis, the effects of gelsemium should be carefully watched, and, as the violent pulsations of the carotids grow less, and the swollen, blue, congested condition of the face subsides, the dose should be lessened, the intervals prolonged, and strychnine resorted to with great caution.

In ordinary cases, indicating the use of gelsemium, 3 to 5 drops may be given to women, 5 to 6 drops to men t. i. d. for an indefinite period. I speak only of the best preparations of the drug.

Gelsemium is an excellent adjuvant in gonorrhœa, and may be given in 5- to 6-drop doses t. i. d. for six to eight consecutive weeks. It is also a diaphoretic in 1-drop dose every half hour, until ten to twenty drops are taken, the patient being well wrapped up in bed. Great advantage may also be found from its use in hysteria, *especially* that form arising from ungratified sexual desire or venereal excesses. Gelsemium obtunds the sexual appetite and allays the irritability of the generative organs.

In acute congestions of the brain and great nerve-centres, caused by heat-stroke or opium hypodermically given, it is invaluable.

I will say nothing of its value in fevers, pneumonitis, pleurisy, neuralgias, and other affections, but refer to text-books.

W. D. HUTCHINGS, M.D.

MADISON, IND.

LABOR COMPLICATED WITH SHORT UMBILICAL CORD.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Having met with the following somewhat unique case of difficulty in a case of obstetrics, I thought, perhaps, a history of the same would be of interest to your many readers, and put them on their guard, if ever, perchance, their experience should coincide with mine.

On August 14, at 10 P.M., I was called to attend Mrs. R. M., aged 29 years, who had already borne eight children. My patient had been in labor some hours. Pains all dorsal and quite severe. Found vertex presenting (O. R. P.); os dilated to about the size of a dollar. It was much cicatrized, tense, and very sensitive. Membranes already ruptured. As the case was some ten miles in the country I had to "stay it out." After some four hours the pains became intensified, and, by means of gentle manipulation of the os, dilatation gradually became accomplished, and the child presented at the perineum. I told my patient her trouble would soon be over. The pains continued, yet no progress was made, and, after waiting half an hour, I found that suddenly the presentation had changed to a face presentation! The next pain having made no impression on the child, I anæsthetized my patient, and delivered her of a fine ten-pound girl. I soon discovered the cause of all the trouble. The cord was only eight inches long, and the placenta was attached to the uterus by as much as two-thirds of its entire surface! I experienced considerable trouble in separating the placenta, but succeeded in so doing by patiently scraping and tearing it away with my finger-nail. (I prefer this method to using a curette.) I then washed out the uterus with a solution of hydrarg. biniodid., and my patient is making a good recovery, without a single backset.

In a somewhat extensive obstetrical practice, I have met with abnormally short cords, but never one so short as this, nor with the additional trouble of attached placenta.

HOWARD LANKESTER, M.D.

FISHER, MINN., August 17, 1889.

THE INFLUENCE OF THE ENTRANCE OF AIR INTO THE VEINS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the September number of your journal I published an article entitled "The Influence of the Entrance of Air into the Veins," in which I stated that very little work of an original character had been done in this country upon this subject.

My attention has just been called to a very able research instituted some years ago by Dr. Nicholas Senn, of Milwaukee, which I was unfortunate enough to overlook when writing my paper.

I write this letter to you fearing lest my oversight may be misunderstood, and for the purpose of acknowledging Dr. Senn's priority in this country.

Yours, very truly,
H. A. HARE.

THE EFFECTS OF THE ENTRANCE OF AIR INTO THE VEINS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I have read with much interest Dr. Hare's communication to the last number of your journal,—the effect of the entrance of air, etc. The subject is one which has interested surgeons for years. Unfortunately, we cannot draw too close an analogy between man and the lower animals in this instance. It is to be hoped that further experimentation may afford us some consolation and relief from this so-called "surgical superstition," as it has been denominated by a leading medical journal.

It has been shown that, even among the lower animals, there exists a marked difference in their susceptibilities. So eminent an authority as Professor Billroth, in giving the results of his experiments, states, "If with a syringe you pump only a small quantity of air into the jugular vein of a rabbit, it soon dies; while you may sometimes pump several syringefuls of air into a dog without observing any effect." The writer has noted the same effect upon cats.

I must acknowledge such results as interesting, and of scientific value, as regards the physiological process in the lower animals, but I am not satisfied there is sufficient evidence from these experiments to justify the medical press, or any one, relegating this "old" belief to the class of superstitions.

Dr. Hare distinctly states that his observations were upon dogs. The experiments of Professor Billroth* compels us to hasten slowly in accepting any analogy to man.

Very truly yours,
JOSEPH LEIDY, JR.

PHILADELPHIA, October 5, 1889.

THE USE OF ACETANILIDE IN REFLEX COUGH.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Mrs. T., a multipara, had from the fourth month, in two pregnancies, a most distressing and incessant cough, ceasing only with the birth of the child, and then instantly, with no return. When she requested a recipe for her cough, it was prepared, with the remark, "I know it will do me no good. I have used a number of prescriptions, and everything my neighbors can suggest." I run the gamut of cough mixtures, up and down again, with no effect whatever. At the end of a two weeks' siege she said, "That's just the way it was before." And then it was I learned the true history of the case. Put her on small doses of acetanilide, and in forty-eight hours she was comfortable, and, after a week, a 3-gr. powder a day was sufficient to completely control the cough, and now, after six weeks' use of the powders, is scarcely troubled in the least. About the only thing she notices is a slight disposition to clear the throat, which, upon inspection, appears normal.

W. M. SCHULTZ, M.D.

BUTTE, MONTANA.

THE USE OF QUININE IN ORDINARY SUMMER COMPLAINT OR CHOLERA MORBUS OF ADULTS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—The almost specific action of quinine in the above trouble, especially in allaying the vomiting, is worthy of mention, my attention being first called to it under peculiar circumstances.

A young lady, aged 20, suffered severely for two days. Deriving no benefit from "home" remedies, I was called. Finding her stomach so irritable as not to retain the medicine prescribed, after three or four attempts, I gave her, for the want of something to give, and having a more urgent call else-

* Billroth, "Surgical Pathology and Lectures," p. 31, vol. i., 1877.

where, four or five powders of quinine, 3 grs. each, which I happened to have with me, directing her to take one every two hours on the tongue until my return. On the next visit, a short time after, my surprise was great to hear the patient state that "they were good powders you left me, for I felt a great deal better after taking the first one." I continued the quinine for another day, combined with an astringent pill, in which time the patient fully recovered. Since then, in every similar case, I have used the same remedy, and never had it fail me.

In writing of this peculiar action of quinine, as experienced by me, I have no explanation to offer, save the hypothesis that the vomiting may be due to micro-organisms, and the quinine acting as a germicide.

W. MOREHOUSE GALLIGER, M.D.

SCRANTON, PA.

INCUBATION OF MEASLES.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the last number (October) of the GAZETTE I noticed an article on the "Incubation Period of Measles," which brings to my mind my own experience with this disease.

During the winter of '86–'87 we had an epidemic of measles in this county. After the epidemic had subsided I was called fifty miles into an adjoining county to see a severe case of measles. The people lived in a dug-out, and I was obliged to remain all night. I saw this case the first week in March, 1887. I did not see any more cases after this, and I am positive that I did not come in contact with any cases after the above visit.

In just *thirty* days after seeing this case I developed the measles, and the first rash appeared on my forehead. I was very sick for several days before and after the appearance of the rash. I have never fully regained my former state of health.

Yours truly,

L. R. MARKLEY, M.D.

KIMBALL, NEB., October 20, 1889.

Notes and Queries.

PEAT-MOSS AS A DRESSING MATERIAL.

In the *Voënno-Meditsinsky Jürnal*, June, 1888, p. 75, DR. N. N. JAKIMOVITCH, of St. Petersburg, publishes an interesting paper on moss as a material for surgical dressing (*London Medical Recorder*, June 20, 1889). The high absorbent powers of various mosses, especially of the peat-moss (*sphagnum*), have been utilized by inhabitants of northern regions from time immemorial. Thus, according to Drs. A. F. Middendorf and A. E. Nordenskiold, the Samoiēds and Tchuktchis employ moss for preparing lamp-wicks and as a bedding material for infants. [Similarly, Dr. E. J. Pokrovsky, of Moscow, in his invaluable medico-anthropological monograph on the "Physical Development of Children" (1884), p. 188, says that a soft and dry moss is employed as bedding for infants' cradles by Laplanders, Lithuanians, Tcheremisses, and Samoiēds. The latter, however, use the material for the purpose only in summer time, while in winter they prefer to place their infants on a thick layer of a coarsely-powdered, soft and dry rotten birch-wood. The moss litter is changed several times a day. By its use the infant's bed is kept in a very clean and generally healthy state.—*Rep.*] As a material for surgical dressings moss was introduced first by Professor Leisrink in 1882, whose recommendation was soon followed by similarly favorable communications emanating from Drs. Hagedorn, Milk, Korach, Neshel (*vide* the *London Medical Recorder*, 1885, p. 336), H. A. Lediard (see the *British Medical Journal*, October 18, 1887, p. 829), etc., and referring mainly to the peat-moss. The latter grows abundantly over marshy and low districts of the northern regions of Europe, Asia, and America. In Germany nine species of the *sphagnum* only are found (as Hagedorn states), while in North Russia the natural family Sphagnaceæ has fourteen representatives (*vide* Dr. Ivanitzky's paper in the *British Medical Journal*, 1887, vol. ii. p. 492). As is known, the peat-moss constitutes the most essential ingredient of the peat or turf which has been similarly recommended as a surgical dressing by Professors Esmarch, Neuber, and Trendelenburg. The so-called "vegetable felt," which is largely used (especially in a powdered form) all over West Russia for disinfecting middens, privies, etc., is nothing more than a compressed peat-moss. The Russian literature contains a whole series of papers, dealing with peat-moss as a material serving for the latter purpose (Leshtchinsky, Necki, Milzer, Uspensky, Bekarevitch, etc.), but the researches concerning the substance as a dressing material are yet but scanty. Meanwhile, the matter presents a great practical interest, since the moss-dressing, being cheap, is employed

in many hospitals and in country practice, and there is every probability that it will be used on a gigantic scale at the very first opportunity under the form of some wholesale international thrashing, commonly named "war." At all events, considerable piles of the material are stored in various nooks and corners, and many specimens of problematical value are in the market. One of the specimens has been recently handed over for examination to Dr. Jakimovitch by Dr. N. A. Vilchkovsky, the senior surgeon of the St. Petersburg Nikolaĕvsky Military Hospital, who received it from the Russian Red Cross Society. Macroscopically, the specimen proved to represent a fairly dense but exceedingly light and expansive mass, of a light-brown color, with coffee-brown spots, consisting of minute twigs and fibres of the *Sphagnum subsecundum*, *S. nemoreum*, and *S. Girgensohnii*, with a copious admixture of broken branches, roots, and leaves of some foreign plants (shrubs and herbs). The general conclusions drawn by the writer from his experiments are as follows: 1. Moss as a dressing material cannot be regarded either as an aseptic or antiseptic. 2. Being extremely friable, it easily breaks into powder. Hence it is apt to fall out of pads, to soil linen, and to give rise to displacements of the whole dressing applied. 3. Being excessively voluminous and light, it is inconvenient in regard to transportation, especially in war time. 4. Its absorptive power, however, is very considerable. 5. To become fit for use in the capacity of an aseptic and antiseptic dressing, it must be previously subjected to a special treatment. [In his communication on peat-moss in the shape of "vegetable felt," Dr. A. J. Leshtchinsky alleges (*Transactions of the General Meeting of the Russian Railway Medical Men*, 1886, p. 57) that the material possesses powerful disinfecting or parasiticide properties. However, Dr. D. M. Uspensky, of Professor A. P. Dobroslavin's laboratory, has proved (*Vratch*, Nos. 32 and 33, 1887, p. 613),—1, that the "vegetable felt" contains as many as seventy thousand living germs in each one gramme (of powder); 2, that, besides mould fungi, there are constantly present bacteria and micrococci of various species, some of which liquefy jelly and some do not; 3, that the substance does not destroy the microbes of typhoid fever, cholera, and anthrax, and even decidedly promotes their growth; 4, that, therefore, the "vegetable felt" does not represent anything like an "antiseptic" material.—*Rep.*]

BEET-ROOT IN HABITUAL CONSTIPATION AND HEMORRHOIDS.

In the St. Petersburg new periodical (*Meditsina*, No. 6, 1889, p. 10) DR. S. K. KAZATCHKOFF draws attention to the fact that a strong infusion or decoction of the common beet-root (*Beta vulgaris*; Russ., *bŭrakĭ* or *svĭoklа*) represents an excellent mild aperient, very much in favor with the South Russian peasantry, who resort to it especially in cases of atonic habitual constipations and hemorrhoids. It is taken in doses from ½ to 1 tumblerful at bedtime, or early in the morning, about an hour before breakfast. The remedy does not cause any abdominal pain, griping, or rumbling, nor does it create any tendency to consecutive constipation. On the contrary, any disposition in that direction is decidedly removed by a daily use of the decoction for a certain period. It is stated, however, that the patient's bowels get habituated to the beet-root in a week, so that, by the end of that time, the dose of the decoction should be increased, or a couple of apples a day be added. According to the author's experience, many constipated patients prefer the beet-root "juice" to castor oil, rhubarb, podophyllin, magnesia, milk-sugar, milk, mineral waters, and similar ordinary means, used by them previously to their making acquaintance with the simple remedy under consideration.—*London Medical Recorder*, June 20, 1889.

A NEW LAW—EVERY CASE OF TYPHOID FEVER SHOULD BE REPORTED TO THE HEALTH OFFICER.

Typhoid fever is a disease which the State Board of Health has declared to be "dangerous to the public health," and as such it comes under the law requiring physicians to report to the health officials. Any physician who shall neglect to immediately give such notice "shall forfeit for each such offence a sum not less than fifty, nor more than one hundred, dollars." *After October 1, any householder* who shall refuse or wilfully neglect to give such notice shall be deemed guilty of a misdemeanor, and is liable to a fine of one hundred dollars, or, in default of payment thereof, may be punished by imprisonment in the county jail not exceeding ninety days.

It seems important that the people generally shall understand this new law, which applies to scarlet fever, diphtheria, small-pox, and all such dangerous diseases, as well as to typhoid fever; but at this time of the year

typhoid fever is usually most prevalent, and it is especially dangerous in times of drought. Therefore the safety of the people may now be greatly promoted by having every case of typhoid fever reported to the health officer, who is by law (Section 1, Act 137, Laws of 1883) required to promptly attend to the restriction of every such disease. A new law, which takes effect October 1, makes it a misdemeanor, punishable by fine or imprisonment, for the health officer knowingly to violate that section of the law, or for any person knowingly to violate the orders of the health officer made in accordance with that section. But the actual penalties which are incurred by the violation of these laws are the *death penalties* to many of our people, about one thousand being lost in this State in each year from typhoid fever. The saving of a large proportion of these lives is the real reason for the effort, in which, it is hoped, all our people will join, for the restriction of typhoid fever and other dangerous diseases.

A PRECAUTION TO BE TAKEN AFTER GIVING AN INJECTION OF MORPHINE.

M. HUCHARD, in his fortnightly notes on therapeutics, points out how necessary it is, after giving a hypodermic injection of morphine, to maintain perfect silence in the room where the patient is lying. Morphine, far from suppressing sensitiveness, like chloroform, rather tends to exalt the excitability, and particularly the liability to disturbance from slight noises. This peculiar exaltation of excitability is most marked in the frog, but may also be noted in other animals and in man, though the fact does not appear to have received proper attention hitherto. The failure of morphine injections to procure sleep is, in the majority of instances, due to neglect of this simple precaution.—*London Medical Recorder*, June 20, 1889.

A CASE OF POISONING FROM PELLETIERINE.

In the *University Medical Magazine* for August, 1889, DR. E. B. LANDIS, reports a case of poisoning from pelletierine, which, in its general symptoms, closely agrees with a case of poisoning from male fern and the extract of pomegranate, reported by Dr. Bayer in the *Prager Medicinische Wochenschrift*.

Dr. Landis's case is as follows:

C. R., a male, æt. 26, having at various times passed fragments of tænia, applied to the hospital for relief. In the evening an enema was given to empty the lower bowel. The next morning at five o'clock a bottle of Tanret's pelletierine, containing ½ ounce, was given in a glass of sweetened water. Ten minutes after its administration there was marked disturbance of vision, with dilatation of the pupils. This gradually grew worse, until there was inability to distinguish one object from another, everything appearing in a confused mass. With the disturbance of vision there was violent headache, dizziness, and gastric uneasiness, which gradually grew worse, and which finally led to violent retching and vomiting. The patient was unable to sit up, partially on account of the dizziness, but chiefly because of the general prostration. The pulse was rapid and feeble, and the temperature rose to 101.5°. The respirations were also rapid and shallow. A cold sweat broke out, which was limited to the head and face. Drowsiness came on, and continued for five hours.

One hour after the administration of the drug a purge was given, which emptied the bowels about 9 A.M., bringing away numerous pieces of tænia, and which was accompanied with retching and vomiting. After this the symptoms gradually diminished, but it was not until about thirty-six hours after the drug was given that the disturbed vision, dizziness, and nausea had entirely disappeared.

One very marked feature of the case was the diminution in the quantity of urine excreted. During the twenty-four hours not more than twelve ounces were passed, the color of which was dark and the odor very offensive. The prostration of the patient was extreme, and diarrhœa continued for several days.

PHENACETIN IN PERTUSSIS.

DR. GEO. C. IRWIN, of Sabetha, Kan., reports a case of uncomplicated pertussis, with severe laryngeal spasms of hourly occurrence, in an infant aged 3 months, for which, after using atropine, antipyrin, quinine, and other remedies so often recommended for this disease, he gave phenacetin in ½-grain doses in 10 drops of pure glycerin, which is a moderately good solvent, and was surprised to find that it immediately gave relief, so that the first night after using it every four hours the

child obtained six and one-half hours' good rest, and there has been a steady and gradual improvement since.—*Archives of Pediatrics*, August, 1889.

CARISSA XYLOPICRON.

The wood of this plant is used, like the quassia-wood, for making cups, which, when filled with water, give up a certain part of their bitter principle, and may be used in fevers or where a tonic is required; it is even said to possess vermifuge properties. In Mauritius the drug is employed considerably for this purpose. DUQUESNE claims that he has obtained remarkable success with the use of an alcoholic extract of the root of this drug. He administers it in doses of from 5 to 7 grains as a substitute for quinine for intermittent fever.—*Der Fortschritt*, July 20, 1889.

THE PROPHYLAXIS OF TUBERCULOSIS.

The standing committee of the Congress for the Study of Tuberculosis, consisting of MM. Chauveau (President), Butel, Cornil, Grancher, Landouzy, Lannelongue, Legroux, Leblanc, Nocard, Rossignol, Verneuil, Villemin, L. H. Petit (Sec. Gen.), have issued the following "Instructions to the Public, to Enable it to Know and be Capable of Protecting Itself against Tuberculosis" (*Lancet*, August 10, 1889). The document was communicated to the Academy of Medicine on July 30. When it came on for discussion at the meeting of the Academy, on August 6, the document was submitted to severe criticism, especially by Drs. G. Sée and Dujardin-Beaumetz, the latter declaring there was no evidence that tuberculosis was propagated through meat. Other speakers also criticised the recommendations in Clause 6, and eventually the debate was adjourned to the 13th inst.

I. Tuberculosis claims more victims in towns, and even in rural districts, than any other disease. Thus, in 1884, for example, of fifty-six thousand nine hundred and seventy deaths in Paris, about fifteen thousand, or more than one-fourth, were due to tuberculosis. The tuberculous are so numerous because pulmonary phthisis is not the sole manifestation of tuberculosis, as has been erroneously believed by the public. Physicians have good ground for considering as tuberculous many other diseases besides pulmonary phthisis. In fact, a number of cases of bronchitis, catarrhs, pleurisies, croup (gourmes), scrofula, meningitis, peritonitis, enteritis, white swellings (osseous and articular), and cold abscesses are tuberculous diseases as formidable as pulmonary phthisis.

II. Tuberculosis is a parasitic disease, virulent, contagious, transmissible, caused by a microbe,—the bacillus of Koch. This microbe penetrates into the organism by the digestive canal with food, by the air-passages with inspired air, by the skin and mucous membranes following sores, punctures, wounds, and various kinds of ulceration. Certain diseases—measles, small-pox, chronic bronchitis, pneumonia; certain constitutional states due to diabetes, alcoholism, syphilis, etc.—greatly predispose the individual to contract tuberculosis. The cause of tuberculosis being known, the precautions taken against its germs are capable of preventing its propagation. We have an encouraging example in the results obtained in respect to typhoid fever, the epidemics of which diminish in all towns where steps have been taken to prevent the typhoid germ mingling with drinking water.

III. The parasite of tuberculosis may be met with in the milk, muscles, and blood of animals serving for the food of man (ox, cow especially, rabbit, poultry). Raw or underdone meat and blood, being capable of containing the living germ of tuberculosis, should be prohibited. Milk, for the same reason, should only be consumed after being boiled.

IV. Owing to the dangers arising from milk, the protection of young children, who are so readily attacked by tuberculosis in all forms (since there die annually in Paris more than two thousand tuberculous children below the age of two years), should especially engage the attention of mothers and nurses. The ideal is, of course, lactation by the healthy woman. A tuberculous mother should not nourish her child. She should intrust it to the care of a healthy nurse living in the country, where, under the best hygienic conditions, the risks of tuberculous contagion are much less than in the towns. The child thus brought up will have a great chance of escaping tuberculosis. If suckling at the breast be impossible, and it has to be replaced by feeding on cow's milk, this milk, given to the infant by the bottle or spoon, should always be boiled. The unboiled milk of asses and goats is far less dangerous.

V. Owing to the dangers arising from butchers' meat, which may preserve all the characters of health even when the animals

are tuberculous, the public is largely interested in being assured that the inspection of meat, required by law, is properly and generally practised. The only absolutely certain means of avoiding the dangers of meat coming from tuberculous animals is to cook it to such an extent that the deep parts are as well done as the surface; only thoroughly roasted, boiled, or fried meat is devoid of danger.

VI. On the other hand, the germ of tuberculosis, being capable of transmission from the tuberculous to the healthy subject by sputa, pus, dried mucous discharges, and all objects laden with tuberculous dust, it ought, to insure security from the transmission of tuberculosis, to—1. Be known that the sputa of the phthisical being the most formidable agents for the transmission of tuberculosis, there is a public danger in distributing them on the soil, carpet, hangings, curtains, napkins, handkerchiefs, cloths, and coverings. 2. Be well understood, in consequence, that the use of spittoons should be imposed everywhere and upon everybody. These should always be emptied into the fire and cleansed with boiling water; they ought never to be emptied on dust-heaps, or in gardens, where they may tuberculize the poultry, nor into the latrines. 3. Not to sleep in the bed of a tuberculous subject; to dwell in his room as little as possible, and especially not to suffer young children to sleep there. 4. To remove from places, inhabited by the phthisical, individuals regarded as predisposed to contract tuberculosis, subjects born of tuberculous parents, or having had measles, small-pox, pneumonia, repeated attacks of bronchitis, or suffering from diabetes, etc. 5. Not to use objects which may have been contaminated by the phthisical (linen, bedding, clothing, objects of toilet, hangings, furniture, toys) except after previous disinfection (high pressure steam, boiling, sulphur vapor, lime-washing). 6. To insure that the rooms of hotels, lodging-houses, châlets, or villas occupied by the phthisical in watering-places or winter resorts are furnished and carpeted in such a way that disinfection may be readily and completely effected after the departure of each patient; the best plan would be that these rooms should have neither curtains, carpets, nor hangings; that they should be painted with lime, and the floor be covered with linoleum.

The public is mainly interested in preferring hotels in which such indispensable hygienic precautions and measures of disinfection are carried out.

In this connection we make mention that the second Congress for the Study of Tuberculosis will be held at the end of the month of July, 1890, under the presidency of Professor Villemin, when the following questions will be submitted for discussion: 1. The identity of tuberculosis in man and that of the bovines, gallinæ, and other animals. 2. The bacterian and morbid associations of tuberculosis. 3. The hospitalization of tuberculous subjects. 4. Agents capable of destroying the bacillus of Koch, non-injurious to the organism, as regards the prophylaxy and the therapeutics of human and animal tuberculosis. Intimation of intention to be present and subscriptions (twenty francs) should be forwarded to M. G. Masson, Treasurer, 120 Boulevard Saint Germain, and that communications which concern papers should be addressed to Dr. L. H. Petit, General Secretary, 11 Rue Monge, Paris.

A NEW TREATMENT AND POSSIBLE CURE FOR CANCER.

The anonymous correspondent of the *Lancet*, whose suggestion of the combined use of papain and thallin in cancer was noticed in the last number of the *London Medical Recorder*, turns out to be Dr. J. Mortimer Granville. He has since supplemented his first statement by a further communication, in which he says that if the solvent or digestive power of the papain is to be brought to bear on the morbid growth, it must not be exhausted by being first mixed with food. He, therefore, recommends *very frequent* administration of the papain and thallin and their combination in the form of pills. The aim is to get absorption of the drug, not local action on the stomach. In cancer of that organ, Dr. Mortimer Granville gives, besides the pills, papain suspended in water with thallin and an alkali. With the view of further preventing exhaustion of the papain, he directs that the patient shall be fed as exclusively as possible on a vegetable diet, and that the pills shall be taken before meals or in the interval between them. He has not found that the thallin given as described exerts any injuriously depressing effect on the organism as a whole. The vitality of the morbid growth *seems* (the italics are Dr. Mortimer Granville's) to be depressed by saturation with the thallin and papain locally; this is effected by applying a strong paste of the two drugs in combi-

nation, or, where practicable, by their inunction. The results obtained so far are said to be encouraging, and "make it clear that the method will deserve a full and fair trial by the profession."—*London Medical Recorder*, August 20, 1889.

PICHI.

The Chilian drug "pichi" (*Fabiana imbricata*) has been the subject of chemical investigation by different persons, but with somewhat discordant results. According to Dr. Rodriguez, who first called attention to it as a remedy in disorders of the liver and urinary organs (*Pharm. Journ.* (3), xvi. 542), the leaves and twigs yielded a crystalline, fluorescent substance, resembling æsculin, together with paviin and fraxin, two other constituents of horse-chestnut bark, a resin, and an essential oil. In addition, Dr. Lyons subsequently reported the presence of a bitter alkaloid, that he named "fabianine," yielding crystalline salts, and a crystalline neutral body, rich in carbon (*Pharm. Journ.* (3), xvi. 722). Then the drug was examined by Messrs. Nivière and Liotard, who failed to find any traces of an alkaloid or of the neutral crystalline compound, and attributed any therapeutic action it might exercise to the crystalline, fluorescent, glucoside principle (*Pharm. Journ.* (3), xviii. 460). More recently (*Amer. Journ. Pharm.*, August, p. 405) it has been examined by Messrs. Trimble and Schroeter, using the wood and bark, and they also have failed to detect an alkaloid, but confirm the presence of a fluorescent glucosidal principle, as well as of a crystalline neutral resin soluble in ether, strong alcohol, and chloroform, and insoluble in water, which they represent as of no medicinal value, and as having a composition agreeing with the formula ($C_{28}H_{32}O_5$).—*Pharmaceutical Journal and Transactions*, August 31, 1889.

CHROMIC ACID FOR SWEATING OF THE FEET.

During the year 1888 more than eighteen thousand Prussian soldiers were treated with a solution of chromic acid for sweating of the feet. A five per cent. solution was applied by means of a brush. The application was made after the feet had been washed and thoroughly dried, and the feet were left uncovered until the acid completely combined with the skin. The effect of the treatment was that the skin became drier, harder, and less tender. The wet, red skin became dry and smooth, and the unpleasant odor of the decomposing sweat disappeared. Many cases were cured or much improved by one application, and most of them by two or three. Where a second application had to be made, it was made after an interval of a week to a fortnight, when the hardened epidermis had peeled off. The effect of the second painting lasted longer than the first. A very gratifying result to the military authorities was the great improvement in the marching of the soldiers who had undergone the treatment.

A ten per cent. solution did not give better results than the five per cent. It appears that forty-two per cent. were healed, fifty per cent. improved, and only eight per cent. unrelieved. In seventy-five per cent. of the cases only, and generally after the use of more concentrated solutions than five per cent., were vesication, eczema, and wounds of the skin caused by the paint. The following conclusions were drawn respecting the treatment: 1. Chromic acid is the quickest and best remedy, or, at any rate, it is as good as salicylic acid preparations for sweaty feet. 2. The remedy is easily applied; it is cheap and clean. 3. It does no harm when the acid is pure and a solution of the right strength used. The irritability of the skin may be first tested by weaker solutions before the ordinary solution is used. 4. The application should be made by the doctor himself. 5. Wounds and ulcers on the feet must first be healed before the chromic acid is applied. 6. The best time to paint the feet, which have been washed and thoroughly dried, is about bedtime. As already stated, the second application is made a week or a fortnight after the first.—*Medical Chronicle*, September, 1889.

DIAGNOSIS OF CEREBRO-SPINAL MENINGITIS BY PUNCTURE OF THE LIVER.

Dr. C. Bozzolo reports in *La Riforma Medica* an interesting case of cerebro-spinal meningitis, in which the diagnosis was assisted by bacteriological observations made on the fluid obtained by puncturing the liver. A man, aged 54, who had been ill for five days previously, was admitted into the clinic at Turin suffering from feverishness, pain in the right side of the neck, jaundice, enlargement of the spleen, painful enlargement of the liver, bronchitis, and albuminuria. A rigor occurred more than once. Except the

pain in the neck and vomiting, no symptom whatever of meningitis existed. Six days after admission the patient died, having been slightly delirious for the previous forty-eight hours. Diagnosis being difficult, the author had on the fourth day after admission made an exploratory puncture of the liver, which was still painful. The blood extracted showed by cultivation and after experiments on animals the existence in it of Fraenkel's diplococcus of pneumonia. This result, in the absence of pneumonic and pleuritic symptoms, with the existing pains in the neck and vomiting, encouraged Bozzolo to diagnose meningitis,—a diagnosis which was confirmed by the post-mortem examination. In addition to the morbid changes in the meninges, gall-stones and acute endocarditis were found.—*Lancet*, September 21, 1889.

IODOFORM IN MALIGNANT PUSTULE.

Dr. E. Rinonapoli (*Bolletino della R. Accad. Med.-Ch. di Napoli*, No. 3, 1889) gives particulars of several cases of malignant pustule treated by the subcutaneous injection of a solution of iodoform in ether. Dr. Rinonapoli began this method in 1886, some thirteen months before Senger's work on the antiparasitic action of iodoform appeared. The method employed is that of several injections into and around the seat of the pustule of a ten per cent. solution of iodoform in ether. The pain attending the injections is of severe burning character, but soon passes off. The beneficial effects are rapid in their appearance. In three or four hours after the injections, even in advanced cases, the fever lessens, the swelling round the pustule disappears, the tongue becomes clean, and the patient is able to sleep and to take food. The treatment appears to be of distinctly specific character, and to arrest at once the growth and multiplication of the charbon bacillus. If applied at the outset of the attack, the effect is said to be almost magical.—*Lancet*, September 21, 1889.

PATHOLOGY OF SEVERE BURNS.

Dr. Oscar Silbermann, of Breslau, studying the clinical and pathological signs of the destruction of numerous red blood-corpuscles, found by his experiments: 1. That after extensive burns of the skin the red blood-corpuscles alter their form and lose their power of resistance to heat, drying, compression, and staining. 2. In consequence of these alterations, numerous thromboses in the arterioles and capillaries, especially in the finer branches of the pulmonary artery, occur, leading to stasis in different organs,—*e.g.*, lungs, kidneys, stomach, bowels, liver, spleen, skin, and brain. 3. The large deviation of the pulmonary capillary circulation produces a considerable impediment to the emptying of the right heart and serious venous congestion, as well as dangerous arterial anæmia. 4. This state, coupled with the above-mentioned symptoms, leads to bleeding and parenchymatous alterations in the affected organs. 5. The interference with the circulation also produces dyspnœa, a small pulse, angina, eclampsia, and anuria, as well as a remarkably low temperature.—*Lancet*, September 28, 1889.

MERCURIAL INUNCTIONS IN GLANDERS.

Dr. Gold publishes in the *Meditsinskoĕ Obozrênie* a detailed account of a case of glanders which was successfully treated by a prolonged course of mercurial inunctions. The patient was a young peasant, and though he was unable to trace his illness to any contact with glandered horses, experimental observations on guinea-pigs proved quite clearly that he was suffering from glanders. Half a drachm of mercurial ointment was rubbed into the skin twice a day, and the condition of his mouth properly attended to. He was also kept on highly nourishing diet. The tumors on different parts of the body were opened, and in some cases the edges of the wounds pared or touched with the actual cautery, antiseptic dressings being employed throughout. No less than sixty-eight frictions were employed, and the patient was kept five months in hospital before being discharged cured. The good effects of the treatment began to show themselves after twenty inunctions, the tumors becoming softer and the fine crepitation in the lungs disappearing. Dr. Gold points out that no reliance should be placed on the denial of patients of having had to do with diseased horses, the only sure guides to a correct diagnosis being bacteriological observations and the experimental infection of animals with the purulent matter from the tumors. Again, he thinks this case shows that even very severe cases of glanders may sometimes be treated successfully by a persevering employment of mercury, either by inunctions or hypodermically.—*Lancet*, September 28, 1889.

TRICUSPID STENOSIS.

From some facts collected by M. LEUDET (of Rouen) and his father, the late PROFESSOR LEUDET, the comparatively rare condition of stenosis of the tricuspid orifice (*L'Union Médicale*, No. 96) may be either congenital or acquired. The former arises either in fatal endocarditis or from a malformation producing an excessive amount of muscular tissue at the auriculo-ventricular junction. In consequence of the stenosis, there may also be patency of the foramen ovale and incomplete formation of the ventricular septum; sometimes it is associated with pulmonary stenosis or lesions on the left side. Cyanosis is the most frequent symptom; and a systolic bruit, rarely a diastolic, may be produced; while the enlargement of the right auricle may occasionally be detected by percussion dulness crossing the sternum. It is obvious that the diagnosis of the condition is hardly to be determined, from other forms of congenital malformation. M. Leudet has collected details of one hundred and fourteen cases of acquired tricuspid stenosis,—eighty-six females and twenty-two males (in six the sex not stated); and in fifty-seven no antecedent disease, such as rheumatism, chorea, typhoid fever, or scarlatina, was noted. The degree of stenosis may be considerable, and it may be produced by—1, cohesion of the valves; (2) true stenosis of the orifice; (3) obstruction by vegetations, etc. The first often is the most frequent,—"a chronic, slow, silent endocarditis, generalized rather than deep, vegetating but little, yet adhesive and plastic, tending to cause the damaged valves to unite at their margins." In only eleven cases out of the one hundred and fourteen was the tricuspid stenosis solitary; usually there is concomitant mitral stenosis, which is always more marked than the tricuspid. Presystolic thrill and bruit at the xiphoid and above may be present, but do not from these observations appear to be common.—*Lancet*, September 21, 1889.

A CASE OF POISONING BY HYOSCYAMUS.

In the *British Medical Journal* for September 21, 1889, MR. ARTHUR H. DODD reports a case of a woman, about 50 years old, who had been in the habit of occasionally taking tincture of hyoscyamus for gastrodynia. On September 30, Mr. Dodd was called to see her, she having swallowed by mistake, about five minutes previously, six drachms of tincture of hyoscyamus, B. P. In the mean time she had taken some mustard and water. Mr. Dodd found her much excited; pulse rapid, 130, regular; pupils equal, and reacting to light and accommodation. Free emesis was immediately produced by zinci sulph. and vinum ipecac, followed by copious draughts of warm water. In from twenty to twenty-five minutes after taking the poison the pupils began to dilate; pulse 120; and there was now great weakness and trembling of limbs, marked dryness of throat, and flushing of face. She walked with assistance to the bed, though with difficulty, and her extremities were cold. In a short time her pupils were fully dilated, and no longer reacting to accommodation or light; no headache. At 4.30 P.M., although sensible and answering questions rationally, she had difficulty in speaking, and seemed confused, but not giddy. At 5.30 P.M. she tried to rise from the bed, but found herself powerless to move her legs, both upper extremities were also almost completely paralyzed, and her power of grasping was feeble. She was now slightly delirious, wandering in thought and manner. At 8.30 P.M. pupils still dilated; pulse 84, irregular; she was still delirious, but if spoken to sharply answered questions rationally. Later on she was reported to be progressing favorably. On visiting the patient the following morning she was much better, having slept three hours. Vomiting had occurred during the night, which she attributed to pain in the stomach, probably due to the mustard. The bowels had been well relieved by an aperient administered the previous night; tongue clean; pupils smaller, but still rather dilated; pulse regular, 84; dryness of throat had disappeared; she could walk, though there still remained great weakness of limbs; was now able to grasp firmly, and her speech was once more normal. The following day she had recovered completely.

The respiration was unaffected throughout. A slight deafness with which she was troubled was much aggravated while under the influence of the drug.

MAXIMAL DOSES OF NEW REMEDIES.

The following table, which contains also some remedies that have been used in the United States for a number of years, is reprinted from *Merck's Bulletin* for June, 1889, and is stated to have been compiled principally from B. Fischer's *Neuere Arzneimittel* (Berlin, 1889) and from Professor Anrep's and Dr. Voromikin's *Russian Medicinal Agenda*, 1889, I.

Medicament.	Maximal adult dose, by mouth.			
	Single.		Daily.	
	Grammes.	= about grains.	Grammes.	= about grains.
Acid, Cubebic	1	15	5	75
" Hydrobromic, diluted (ten per cent.)	40 drops.		100 drops.	
" Iodic	0.3	4½	1.2	18
" Perosmic	0.015	¼	0.05	¾
" Sclerotic	0.06	1	0.25	4
" Valerianic	10 drops.		40 drops.	
Adonidin	0.006	1/10	0.03	½
Agaricin	0.015	¼	0.05	¾
Allyl tribromide	8 drops.		.....	.....
Aloin	0.3	4½	0.6	9
Amylene hydrate	4	60	8	120
Anemonin	0.03	½	0.1	1½
Antifebrin	1	15	3	45
Apiol, crystallized (solid parsley-camphor)	1	15	4	60
Apocodeine	0.03	½	0.8	1½
Apomorphine hydrochlorate	0.01	⅛	0.5	¾
Arbutin	1	15	4	60
Arsenic bromide	0.01	⅛	.....	.....
" iodide	0.01	⅛	.....	.....
Asparagin	0.1	1½	0.3	4½
Aspidospermine hydrochlorate	0.003	1/20	0.006	1/10
Baptisin	0.03	½	0.1	1½
Bebeerine sulphate	3	45	10	150
Benzene (benzol)	1	15	6	90
Berberine hydrochlorate	0.06	1	0.25	4
Boldoglucin	4	60	12	180
Butylchloral hydrate	1	15	4	60
Cannabine tannate	1	15	2	30
Cannabinon	0.1	1½	0.3	4½
Carbon bisulphide	10 drops.		40 drops.	
" trichloride	0.5	7½	2	30
Cerium oxalate	0.3	4½	1	15
Chrysarobin	0.005	1/12	0.015	¼
Cocaine hydrochlorate	0.15	2½	0.5	7½
Colocynthin	0.4	6	0.8	12
Coniine hydrobromate	0.005	1/12	0.03	½
Convallamarin	0.06	1	0.3	4½
Cotoin	0.08	1½	0.5	7½
Daturine	0.001	1/60	0.003	1/20
Duboisine	0.001	1/60	0.003	1/20
Erythrophleine hydrochlorate	0.01	⅛	0.3	½
Ethyl bromide	20 drops.		.....	.....
" iodide	20 drops.		.....	.....
Ethyl-oxy-caffeine	0.65	10	2	30
Euonymin (evonymin,—the pure resinoid!)	0.5	7½	1	15
Fluid extract: Boldo	1	15	3	45
" " Cabbage-tree bark (from *Andira inermis*)	2	30	6	90
" " Cascara amarga (Honduras bark)	4	60	10	150
" " " sagrada (chittem bark)	4	60	10	150
" " Damiana (*Turnera aphrodisiaca*)	5	75	20	300
" " Golden seal (hydrastis)	2.5	38	10	150
" " Grindelia robusta	3	45	20	300
" " Kava-kava (*Piper methysticum*)	0.65	10	2	30
" " Lily of the Valley (*Convallaria majalis*)	0.5	7½	1.5	23
" " Piscidia (Jamaica dogwood)	5	75	15	225
" " Witch-hazel (hamamelis)	10	150	.....	.....
Fuchsin	0.25	4	0.5	7½
Gelsemine hydrochlorate	0.005	1/12	0.015	¼
Guaiacol	0.1	1½	0.5	7½
Hasheesh	0.1	1½	0.3	4½
Helenin (solid elecampane-camphor)	0.3	4½	1	15
Helleborein	0.03	½	0.12	2
Homatropine hydrobromate or sulphate	0.03	½	0.25	4
Hydroquinone (hydrochinone)	0.8	12	1.5	23
Hyoscine hydrochlorate	0.001	1/60	0.003	1/20
Hyoscyamine sulphate	0.001	1/60	0.003	1/20
Hypnone (acetophenone)	0.5	7½	1.5	23
Ichthyol	1	15	4	60
Iodine trichloride	0.012	⅛	0.08	1¼
Iodol	0.2	3	1	15

Medicament.	Maximal adult dose, by mouth.			
	Single.		Daily.	
	Grammes.	= about grains.	Grammes.	= about grains
Iridin	0.2	3	0.5	7½
Kairin	1	15	4	60
Menthol	1	15	5	75
Mercur-thymol acetate	0.01	⅛	0.12	2
Mercury bichloride, peptonized	0.03	½	0.1	1½
" cyanide	0.03	½	0.1	1½
" formamidated	0.03	½	0.1	1½
" phenate (carbolate)	0.03	½	0.1	1½
" salicylate	0.03	½	0.1	1½
" tannate	0.1	1½	0.3	4½
Methylal	4	60	8	120
Naphthalene	1	15	4	60
Naphthol, Beta-	1	15	4	60
Nickel bromide	0.5	7½	1.5	23
Nitroglycerin	0.001	1/66	0.005	1/13
Paraldehyde	4	60	.....	.....
Parthenicine	0.2	3	1	15
Pelletierine sulphate, or tannate	0.5	7½	5	75
Pereirine hydrochlorate	1.5	7½	2	30
Phenacetin (para-acetphenetidin)	1	15	2	30
Picrotoxin	0.006	1/10	0.02	⅓
Piperine	0.6	9	1.2	18
Podophyllotoxin	0.02	⅓	0.06	1
Potassium osmate	0.015	¼	0.05	¾
Propylamine, so-called. See Trimethylamine	.....	.....	.....	.....
Pyridine	.....	.....	25 drops.	
Quinoline (chinoline) tartrate	2	30	6	90
Resorcin	3	45	10	150
Salicin	2	30	10	150
Salol	2	30	10	150
Silver cyanide	0.005	1/12	0.02	⅓
" iodide	0.02	⅓	0.06	1
Solanine	0.1	1½	0.5	7½
Sparteine sulphate	0.03	½	0.1	1½
Strophanthin	0.0002	1/333	0.0004	1/166
Sulphonal	4	60	8	120
Terpin hydrate	0.3	4½	1	15
Terpinol	0.3	4½	1	15
Thalline sulphate	0.5	7½	1.5	23
" tartrate	0.5	7½	1.5	23
Tincture strophanthus	1.5	23	5	75
Trimethylamine (erroneously called "Propylamine"),—ten per cent. solution	3	45	10	150
Urethane	5	75	.....	.....
Xylene (xylol)	2	30	.....	.....

N.B.—All the above-stated *sizes* of dose are calculated for administration *by mouth* only.—*American Journal of Pharmacy*, September, 1889.

COCAINE-POISONING.

Dr. Vinogradoff gives, in the *Ejenedêlnaya Klinicheskaya Gazeta*, an account of the post-mortem examination in a well-known remarkable case of cocaine-poisoning, where a young woman who was suffering from a tuberculous rectal fistula was given 22 grains of cocaine by means of repeated rectal injections in order to produce local anæsthesia for an operation which consisted in scraping the anterior wall of the rectum with a sharp spoon. In a quarter of an hour the patient became excited, and began to suffer from clonic spasms in the limbs, opisthotonos, and cyanosis. Death occurred from asphyxia, in spite of tracheotomy and prolonged performance of artificial respiration. At the post-mortem examination the blood was found to be fluid, and of a dark-brown color, as in cases of poisoning with chlorate of potassium. There were hyperæmia of the brain and of the lungs, exudative glomerulo-nephritis, evidently of long standing, together with ulceration of the colon and rectum, reaching down to the submucous tissue. Microscopically, there was found albuminoid degeneration of the nerve-cells, of the cerebrum, of the heart-muscle, of the liver-cells, and of the epithelium of the urinary tubules. Dr. Vinogradoff compares this with three other published cases of death from cocaine-poisoning, and

with cases in which large doses had been given with and without the occurrence of toxic symptoms, and shows that as much as 45 grains have been borne without any ill effects. The fatal result in the foregoing case—which, it may be remembered, led to the suicide of the distinguished surgeon who operated—is to be ascribed to the increased power of absorption of the ulcerated intestinal wall, and to the retardation of the kidney secretion by the diseased condition of the glomeruli. It would, therefore, appear that when there is any question of giving large doses of cocaine, a careful examination should be made of the condition of the kidneys, and, if there is any ground for supposing them to be diseased or functionally inactive, the greatest caution should be employed. It may be remembered that, before operating, the unfortunate surgeon asked one of his colleagues, who was a professor of therapeutics, what dose of cocaine might safely be given, the answer being, "Not more than two grains." So that the greatest diversity of opinion exists regarding the maximum dose of the drug.—*Lancet*, September 28, 1889.

ANEURISM IN THE RIGHT ORBIT CURED BY DIGITAL COMPRESSION.

At the meeting of the British Medical Association in the Section of Ophthalmology, Mr. A. H. Benson, of Dublin, related the case of a man, aged 38, who, nine months previously, while fencing with single sticks, received a severe blow with the point of the stick on the outer side of the orbit (*British Medical Journal*, September 28, 1889). The skin of the external canthus and outer portion of the upper lid was cut and bruised. Two months later the right eye was noticed to be more prominent than the left. The conjunctiva was also congested and chemosed. His vision at that time (September, 1888) was, right $= \frac{6}{18}$, left $= \frac{6}{36}$. When first seen by Mr. Benson—on February 2, 1889—the sight of the eye had remained unchanged for months; there was no pain, but a throbbing noise in the right temple and eye. The eye was protruded directly forward, its motion being restricted in every direction. The lids were thick, the whole ocular conjunctiva chemotic, with large tortuous veins, most marked at the outer side. On everting the upper lid, the external portion of the superior *cul-de-sac* was found filled with dark tortuous veins, looking like a mass of worms. The ophthalmoscope showed slight myopic astigmatism, worse in the left eye. The transparent media were normal, but the veins of the right retina were fuller and darker than those in the other eye. With the stethoscope applied over the globe, a loud pulsating *bruit*, synchronous with the pulse, could be heard. No visible pulsation of the globe was observable, nor could thrill be felt with the hand. Tension was normal in both eyes. Compression of the right common carotid completely stopped the *bruit*, which at once returned on removing the pressure. A diagnosis of aneurism in connection with some of the orbital arteries far back was made, and digital pressure determined on. A cast of the face was taken before commencing treatment. On March 18 digital pressure of the right common carotid against the vertebræ was applied for five minutes, then, on successive days, for nine, eleven, thirteen, and fourteen minutes respectively. Digital pressure, varying in duration from ten to fifteen minutes, was kept up night and morning till April 20. On some days the *bruit* could hardly be heard, on others it was louder than ever. The appearance of the eye was unchanged. It was, therefore, determined to try continuous pressure, and, with the aid of relays of assistants, complete occlusion of the common carotid was kept up for two hours and a half. Next day the appearance of the eye was wholly changed. The conjunctiva looked almost normal, the œdema gone, the veins much smaller, those in the superior external *cul-de-sac* having altogether disappeared. The patient stated that he no longer heard the puffing sound. For the next two days compression was kept up. No vascular *bruit* could then be heard with the stethoscope, and the appearance of the eye was normal. No further pressure was applied, but the man was kept quiet till May 13, when he was discharged perfectly cured. At present (August, 1889) some proptosis was still present, but the dilatation of the pupil was wholly gone; and, according to the patient's statement, the eye felt just the same as before the accident. (Four casts, showing the changes which took place during the treatment, were exhibited.) The result in this case seemed to be almost unique. Of eleven cases of traumatic aneurism tabulated by Rivington only one was cured; in two the treatment was so badly borne that it had to be discontinued, while in eight no benefit resulted.

—THE—

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Original Communications.

*NEW THERAPEUTIC AGENCIES.**

LECTURE II.—ON THE NEW ANALGESICS—THEIR APPLICATION TO THE TREATMENT OF DISEASES OF THE NERVOUS SYSTEM.†

BY PROFESSOR DUJARDIN-BEAUMETZ, PARIS, FRANCE.

GENTLEMEN:—In the previous lecture I told you of the benefits which might be derived from suspension in chronic diseases of the spinal cord, and I endeavored to make clear the fact that in certain cases, rare, it is true, an undoubted amelioration has been obtained by this means. I desire to-day to devote this lecture to the application of the new analgesics to the treatment of tabes dorsalis, and I hope to prove to you that great progress has been made in the therapeutics of this affection, as thereby those atrocious pains which render existence oftentimes almost intolerable have been made to disappear in a great number of tabetic patients.

But, in order to treat this subject with all the amplitude that it demands, you will permit me not to limit it to diseases of the spinal cord, but to consider it in its bearings on all the affections of the nervous system.

It is always against pain that the efforts of

* A second series of "New Medications," published in 1887.

† From advance sheets, revised by the author (translated by E. P. Hurd, M.D.). Lectures delivered in Cochin Hospital, Paris, France.

the physician have been the most actively directed, and every practitioner endeavors to realize the words of Hippocrates, "To relieve pain is a divine act." Hence one can but regard as paradoxical the theses formerly defended by Gerike, Monjon, Salgues, and others on the utility of pain in medicine, and particularly in therapeutics.*

Already the discovery of the alkaloids of opium and certain of the Solanaceæ, and their administration by the hypodermic method, had furnished the physician with powerful weapons, and the injections of morphine still constitute the most prompt and certain means of assuaging pain.

I need not here speak of the advantages and dangers of morphine. I have many times discussed this subject, showing that if morphine is an admirable analgesic medicament, it is also the most dangerous of all by reason of the fact that the patient becomes accustomed to and dependent on the morphine injections, and ends in becoming a morphiomaniac.

It may be affirmed that morphiomania has become one of the vices of the day, and we may almost lay it down as a rule, that any patient who for thirty consecutive days takes morphine injections will ever after be a victim to the habit, even when the symptoms of the primary malady shall have completely disappeared; and it will thenceforth be a matter of no little difficulty to cure the morphine habit, now become a disease more rebellious than the affection for which these injections were first ordered.

The number of morphiomaniacs increases every day, and this deplorable vice exists in all classes of society. Unfortunately, our own profession is not exempt from this abuse, and I know quite a number of medical *confrères* who have been or are still victims of morphine.

Hence, it is with an extreme repugnance that I resort to injections of morphine, and when I do resort to them, I take care never to practise these injections several days in succession, leaving always one or more days of interval between. You understand, of course, that these reservations are set aside when I have to do with patients whose existence is strictly measured by the affection from which they are suffering, as persons in the last stages of cancer and tuberculosis, where the calmative and supporting action of morphine is always an advantage.

Moreover, I shall here repeat what I have often said of opium and its preparations, that the older I become, the less use I make of them, because, in my judgment, all things being taken into consideration, the disadvantages attending the use of opiates almost overbalance the advantages.

I know well that in order to get rid of the inconveniences of morphine it has been proposed to make use of another alkaloid of opium, and of late Laborde has recommended, under the name of *meco-narceine*, an association of several of these alkaloids.

You know that Claude Bernard considered narceine as the least toxic and most somniferous of the derivatives of opium. But this soluble *narceine* furnished by Charlard, and which served for the experiments of Claude Bernard, has never since been found. Therefore Laborde counselled a mixture of narceine with other alkaloids of opium which is prepared by Duquesne, and to which has been given the name of *meco-narceine;* this mixture, administered in the dose of ⅙ grain, in pills or in syrup, or even in the form of hypodermic injections, is said to produce somniferous and analgesic effects.†

Constantin Paul has shown the difficulty of employing in ordinary prescriptions a product as complex as this meco-narceine, and, in truth, his judgment seems to be that of the profession, for this combination of Laborde's has not come into general use.

Morphine is not the only active principle derived from the vegetable kingdom which has been utilized in the treatment of pain, and, in particular, in tabes. In the early history of hypodermic medication, it was atropine that was used, but physicians were obliged speedily to abandon this alkaloid by reason of the intolerance which some persons present for this medicament, and the fatal results which have sometimes followed a small dose. Latterly, another active principle, also derived from the solanaceæ, has been employed. I refer to that glucoside which Julius Clarus was the first, in 1839, to introduce into therapeutics,—solanin, to which Geneuil, in 1886, anew called attention.‡

* Gerike, "Dissert. de dolorum utilitatibus e mechanisis causis deductis," Lemstadt, 1839. Monjon, "Sur l'utilité de la douleur," Gênes, 1810. Trad. Michel, Paris, 1817. Salgues, "De la douleur considérée au point de vue de son utilité en médecine et dans ses rapports avec l'hygiène, la pathologie et la thérapeutique," Dijon, 1823.

† Laborde, "Étude d'un nouveau produit tiré de l'opium et présentant les propriétés physiologiques de la narcéine, la méco-narcéine" (*Bulletin de l'Académie de Médecine*, séance du 8 mai, 1888, t. xix. p. 615).

‡ Geneuil, "Étude sur la solanine, ses propriétés analgesiques, son application au traitement des maladies

This writer showed that in the dose of from 3 to 5 grains this glucoside causes rapid diminution of pain.

The experiments made in my wards, which you will find detailed in the thesis of my pupil, Dr. Gaignard,* show in fact that if the dose of 5 grains is often sufficient, this medicament proves very unequal in its action, and hence unreliable. If I add that it is very difficult to procure pure solanin, that, moreover, this glucoside is insoluble, and that, lastly, it is of very high cost, I shall have given reasons enough to lead you to make very little account of this new agent in the therapeutics of affections of the nervous system. Nevertheless, in 1887, Capparoni showed us that, besides its analgesic effects, this medicament has a special action against trembling when given in the dose of 4 or 5 grains; but it was chiefly Grasset and Sarda who pointed out the advantages of solanin in certain medullary affections, and, in particular, in the systematized scleroses of the cord.†

Sarda, as the result of his experience, gives the preference to solanin over antipyrin and acetanilide in affections of the cord accompanied with pain and trembling. If you make use of this preparation, you will administer it in capsules or pills of 10 centigrammes (nearly 2 grains) each, and give two or three such doses in a day. As for aconitine, which has proved itself to be one of the most powerful analgesics of the series of vegetable alkaloids, it is only of use in neuralgias of the face, and its therapeutic properties are not apparent when you desire to combat pains elsewhere, and in particular those symptomatic of diseases of the spinal cord. I have, however, fully treated of aconite and aconitine in the first series of these lectures,‡ and I come now to the principal subject of this lecture,—namely, the employment of the new analgesics derived from the aromatic series. This group of medicaments consists of antiseptics, of antithermics, and of analgesics.

I shall say but little of phenic and salicylic acids. I shall only remind you that salicylic acid was the first of this group to be applied to the treatment of the lightning pains of tabes, and this by Sée, Bouchard, and Luys, when Stricker, in 1876, made known to us its striking utility in the treatment of rheumatic pains. You will find in the communication of G. Sée, made in 1877 to the Academy of Medicine, several observations of *douleurs fulgurantes* of ataxia, where the administration of salicylate of sodium was followed by disappearance of the pains.§ Vidal obtained similar results, and Bouchard, in four patients suffering from ataxia of long standing, dispelled the pains altogether by the administration *per diem* of 10 grammes (150 grains) of salicylate of sodium. But the large doses which it was necessary to give, the cerebral symptoms which resulted therefrom, and the uncertain results obtained, caused salicylic acid to be abandoned, and the medical profession eagerly substituted for this drug antipyrin, from the time that Germain Sée made known to us the marvellous efficacy of this new medicine in relieving pain.

When Knorr, in 1884, discovered dimethyloxyquinizine, and Filehne had made known its antithermic properties, this new chemical body was first applied to the treatment of fevers and of rheumatism, and it was not till 1887 that Germain Sée, in his communication to the Academy of Sciences, clearly demonstrated the analgesic properties of this medicament.‖

Sée showed by experiments on animals that antipyrin acts on the cord and diminishes its excito-motor power, and, moreover, by clinical trials, that this medicament has a very marked analgesic effect, and you will find in the thesis of his pupil Caravias observations not only of neuralgias, but also of the lightning pains of tabes signally benefited by the employment of this remedy. In three cases of locomotor ataxia, which he has reported, these atrocious *douleurs fulgurantes* were kept entirely in abeyance by the administration of 6 grammes (2 drachms) of antipyrin per day.¶

These facts have been since confirmed by a great number of observers, and everybody is to-day agreed that, from the point of view of its analgesic properties alone, antipyrin is one of the most precious acquisitions made to therapeutics during the last few years. On

où domine l'élément douleur" (*Bulletin de Thérapeutique*, 1886, t. cxi. p. 263, et 1887, t. cxii. p. 467).

* Gaignard, "Étude physiologique et thérapeutique de la solanine" (*Thèse de Paris*, 1887).

† Capparoni, "Researches on Solanin," 1887; Sarda, "On Antipyrin and Acetanilide as Nervine Medicaments in comparison with Solanin" (*Bull. Gén. de Thérapeutique*, 1888, t. cxix. p. 433).

‡ "New Medications," Detroit ed., p. 269.

§ G. Sée, "Étude sur l'acide salicylique et les salicylates. Traitement du rhumatisme, de la goutte et des diverses affections du système nerveux sensitif par les salicylates" (*Bulletin de l'Académie de Médecine*, Nos. 26, 27, et 28, juin et juillet, 1877).

‖ G. Sée, *Acad. des Sciences*, April 18, 1887.

¶ Caravias, *Thèse de Paris*, 1887.

this point I fully expressed myself in the first series of "New Medications," to which I must refer you; since that time, repeated observations have but confirmed the opinion there expressed of the remarkable analgesic action of this medicament.

The great solubility of antipyrin renders its administration easy, and you may employ it by the mouth, the rectum, or the hypodermic method. In giving it by mouth you may give it in capsules or in solution. If you prefer to administer it in solution, you will dissolve one gramme (fifteen grains) of antipyrin in a wineglassful of sweetened water, flavored with rum or kirsch.

[A pleasant formula is the following:

℞ Antipyrin, ʒi;
Simple elixir, ʒiii. M.
Dose.—A tablespoonful as often as required.]

Antipyrin may be given by rectum in suppositories or lavements.

The hypodermic method, formerly much in vogue, has been somewhat abandoned by reason of the local irritation and pain caused by these injections when they are too concentrated. Therefore, when employing antipyrin subcutaneously, you must use dilute solutions, even at the risk of having frequently to repeat them. You may, for instance, make use of the following solution:

Antipyrin, grammes v (gr. lxxv);
Boiled water, grammes xx (ʒv).
From 2 to 3 cubic centimetres of this solution may be injected.

As for the dose to employ, I am of opinion that it is rarely best to exceed 3 grammes (45 grains) a day. In the cases reported by G. Sée and Caravias, 6 grammes (ʒiss) of antipyrin were given daily; in these doses you will always be in danger of the antipyrin rash. Hence, in my judgment, you had better not go beyond 2 or 3 grammes *per diem*, and, if this quantity prove inefficacious, you should resort to some other analgesic.

I ought here, before finishing antipyrin, to compare its therapeutic value with that of the other analgesics, but I shall defer this study to the end of the lecture when I shall have treated of the other members of the group, and I shall now take up very rapidly acetanilide, phenacetin, and methylacetanilide (exalgine).

I shall say but little of acetanilide, for the reason that I have discussed this new medicament quite fully in the third edition of my "New Medications."

While Germain Sée in 1887 was studying in the Hôtel Dieu the analgesic action of antipyrin, I was testing at Cochin Hospital the properties of a body which Kahn and Hepp in 1886 had introduced into therapeutics under the name of antifebrin, and of which Professor Lépine, of Lyons, had been the first to study the sedative action on the cerebro-spinal axis. I published in the *Bulletin de Thérapeutique* the results which I obtained. My pupils, Weill and Arthuro Reyès y Sardina, the same year, made known the greater part of the observations collected in our hospital.*

These facts, moreover, were similar to those published at the same time by Grasset, of Montpellier, by Demiéville, of Lausanne, and Fischer, in Germany, and have since been confirmed by a great number of observers, and, in particular, by Podanowski, in his inaugural thesis, Hunston, Clark, Hirsch, Talcott, and Mann.

You will find in my "Dictionnaire de Thérapeutique" all the details and indications pertaining to this medicament, and I pass now to the consideration of phenacetin and exalgine. Here I shall enter into fuller details, for I had not studied these medicaments at the time of my first lectures.

The history of phenacetin and the phenacetins is of quite recent date; they were brought into use for the first time in 1887 by Professor Kast and Dr. Hinsberg. I experimented with phenacetin almost immediately in my hospital wards, and communicated the first results of my experiments to the Society of Therapeutics that same year. I ought also to remind you of the important contribution which Misrachi and Rifat made before the Society of Medicine of Salonica, the inaugural thesis of Hugo Hoppe, defended at Berlin, and, lastly, the experiments of Professor Lépine, as well as the researches undertaken at the clinic of Bamberger, and which have been published by Robler.†

* Dujardin-Beaumetz, "On Acetanilide as a Sedative of the Nervous System;" also THERAPEUTIC GAZETTE, October 15, 1887. Weill, "On Acetanilide" (*Thèse de Paris*, 1887). Reyès y Sardina, "Contribution to the Physiological and Therapeutic Study of Acetanilide in its Action on the Nervous System," 1887.

† Gaiffe, "Les Phénacétines, leur action physiologique et thérapeutique" (*Thèse de Paris*, 1888, et *Bulletin de Thérapeutique*, 1888, t. cxv. p. 71. Misrachi et Rifat, "Étude sur la phénacétine" (*Bulletin de Thérapeutique*, t. cxiv. p. 481, 1888). Kast et Hinsberg, *Centralblatt für die Med. Wissensch.*, 1887–89. Robler, *Wiener Med. Wochensch.*, 1887, 26 u. 27. Hugo Hoppe, "Ueber die Wirkung der Phenacetin" (*Inaugural Dissertation*, Berlin, 1888).

The phenacetins, or acetphenetidins, are three in number,—ortho-, meta-, and para-acetphenetidin; the last is the most in use. At the same time, ortho-acetphenetidin possesses the same properties as the para-, but it is less active; as for the meta-, it is absolutely deprived of active properties.

Para-acetphenetidin, or phenacetin, presents itself under the form of a powder of a reddish-white color, insoluble in water, and little soluble in chloroform and alcohol. This insolubility in the most of our vehicles obliges us always to administer this substance in capsules.

This insolubility also explains why phenacetin is not toxic, or, at least, why it is that you cannot determine fatal symptoms in animals, even in very large doses. Thus it is that Misrachi and Rifat have been able to give to a hen of 1.150 kilogrammes weight 2 grammes (3ss) of phenacetin, and I have myself given to hares weighing 2 kilogrammes as much as 2 or 3 grammes without producing any untoward symptoms other than a fall of one or two degrees of temperature. In man, however, we sometimes observe with feeble doses profuse sweatings and a very pronounced state of collapse.

Para-acetphenetidin, or phenacetin, is an antithermic; but it is chiefly as an analgesic that it is prescribed. In the dose of 50 centigrammes (gr. viiiss), repeated two or three times a day, phenacetin acts like antipyrin, like acetanilide, and alleviates pain. You will find in the thesis of Dr. Gaiffe, and in the memoir of Misrachi and Rifat, very precise observations, bringing clearly into view this analgesic action in the painful manifestations of affections of the cerebro-spinal axis, and particularly of the neuroses.

Like the greater number of medicines which are depressors of the excito-motor power of the cord, phenacetin combats polyuria. We have here a very curious fact in connection with the action of this medicament, to which I shall return in the lecture which I propose to devote this year to the treatment of polyuria.

This analgesic and even somniferous action has been, moreover, confirmed by Greenfeld, by Roë, and by Koller, of Vienna, and you will see, when I come to compare the different analgesics, that phenacetin merits a lasting place in our therapeutic arsenal. At the same time, its extreme insolubility renders it little manageable, and confers on it a marked degree of inferiority to other members of the aromatic series, and, in particular, antipyrin.

I come now to a medicament having much resemblance to the preceding,—methylacetanilide.

It was March 18, 1889, that Dr. Bardet and I communicated to the Academy of Sciences the result of our researches in methylacetanilide.* We had some difficulty at first in being settled about the chemical substance with which we were experimenting; but after the remarks of Giraud,† following our communication, it became certain that we had to do with methylacetanilide, which was obtained in 1874 by Hoffmann.

In fact, acetanilide furnishes four methyl derivatives, which are methylacetanilide, and ortho-, meta-, and para-acetanilide. But the point of fusion at 101° C. enabled us to affirm that the product with which we were experimenting was methylacetanilide.

This body, which has for its formula $C_9.H_{11}N.O$, results from the action of chloride of acetyl on mono-methyl-aniline. It presents itself under the form of beautiful colorless crystals, whose point of fusion is 101° C. These crystals are but little soluble in cold water, but very soluble in alcohol and even in dilute spirit; they have neither taste nor smell. We have undertaken a series of physiological and therapeutic experiments with this substance; these you will find set forth more completely in an excellent monograph by one of my pupils, Dr. Gaudineau, who has devoted his inaugural thesis to this subject.‡ You will also find a full account of the actions and uses of this new drug in a communication made by Dr. Bardet to the International Congress of Therapeutics.§

When you experiment on animals with this substance, you readily perceive its toxic properties. In fact, administered to the hare in the proportion of 40 centigrammes per kilogramme, it causes death in a few minutes, with convulsions and tremblings. In a smaller dose you determine in these animals diminution of sensibility to pain with conservation of the

* Dujardin-Beaumetz and Bardet, "Note sur l'action physiologique et thérapeutique de la méthylacétanilide et sur l'action comparée des composés de la série aromatique" (*Académie des Sciences*, séance du 18 mars, 1889).

† Giraud, "Sur la méthylacétanilide" (*Académie des Sciences*, séance du 8 avril, 1889).

‡ Gaudineau, "On the Physiological and Therapeutic Action of Methylacetanilide (Exalgine)" (*Bull. de Thér.*, 1889, t. cxvii. p. 207).

§ Bardet, "On Methylacetanilide or Exalgine" (*Journal des Nouveaux Remèdes*, August 24, 1889, etc.).

tactile sensibility; then there supervene clonic contractions and epileptiform fits. Add that in cold-blooded animals, as frogs, there is produced a peripheral paralysis of the nerves in doses of 3 to 5 centigrammes (gr. ss to gr. i). Although these animals succumb to asphyxia, in average doses, at least, no methæmoglobin is produced.

This substance is an antithermic, and depresses the temperature from one to three degrees, and even more. Lastly, if I add that under the influence of methylacetanilide, there is augmentation of the arterial tension and blood-pressure, I shall have indicated the principal points in the physiological and toxic action of this medicinal substance, effects which may be thus summed up: An influence very decided on the nervous system, sensory and motor; and, secondarily, on the respiratory and circulatory system, and on thermogenesis.

Administered to the healthy man, in the dose of 20 to 40 centigrammes (gr. iii to vii), and even twice that quantity, in the course of twenty-four hours, this medicament produces no appreciable symptoms, and it has been impossible for us to find in the urine the substance which we were administering. At the same time, in the dose of 80 centigrammes (gr. xiii), there is often produced a sensation of drunkenness and of vertigo.

Habituation plays a considerable *rôle* in the administration of this medicament, in man as well as in animals, and we may, at the end of a certain time, give large doses without producing grave accidents. The vertiginous attacks produced by large doses disappear also in persons habituated to this medicament.

In our clinical researches, exalgine has shown itself to be a very powerful analgesic, and in the numerous cases where we have employed it, it has furnished us remarkable results, often superior to those of antipyrin and acetanilide. I possess two or three very demonstrative observations in this regard. I have seen methylacetanilide subdue pains which had resisted all other analgesics, and this with doses which have not exceeded 50 to 60 centigrammes in the twenty-four hours, and the experiments which my friend and colleague Desnos has undertaken at Charity Hospital confirm our first researches.

It is this elective action of methylacetanilide on pain which has given the name of *exalgine* to this substance; but its therapeutic effects go farther, and show an action quite selective on the rachidian bulb. Hence it is a medicament which is applicable to polyuria, like antipyrin. Lastly, it combats convulsive symptoms, and, perhaps, epilepsy.

As always happens when we study for the first time a medicament, we afterwards find that it has already been experimented with by some other person. Hence, while we were communicating our results to the Academy of Sciences, M. Binet, of Geneva, was making known the results of his studies of this same substance, but from the special point of view of thermogenesis.*

Lastly, quite recently, Hepp, of Mulhouse, has claimed a priority of experimentation with this new drug.† He did, in fact, in an article published in 1887, not only give a study of acetanilide, to which he, with Kahn, gave the name of *antifebrin*, but also of the other methyl derivatives of this body, and, in particular, of methylacetanilide.‡

I must, however, remark that in this study Hepp and Kahn were occupied only with the antithermic properties of the drug, properties which really exist, but which are, in our opinion, absolutely secondary, the action on the nervous system having the principal *rôle* in the physiological and therapeutical effects of this substance.

Now that you know the most of the new analgesic antithermic agents which may be employed as nervines in the treatment of affections of the nervous system, we can compare together these different medicaments and judge of their value.

And, first, in opposition to those discontented spirits who complain of this abundance of analgesics. I maintain that we have reason to felicitate ourselves on the present richness in remedial agents, and we ought to encourge every undertaking which will enable us to augment this precious group of medicaments that alleviate pain. What we need, also, is well to know the special indications for these different substances: to this task of endeavoring to help you to understand these indications I shall devote the remainder of this lecture.

Of all the antithermic analgesics known, that which occupies the first rank is antipyrin, and for the two following reasons: It is the most soluble, perhaps the only one soluble in

* Paul Binet, "On the Physiological Action of Methylformalinide and of Methylacetanilide" (*Suisse Médicale Romande*, 1889).

† *Progrès Médical*, January 15, 1887, and *Berlin. Klin. Wochensch.*, 1887, No. 1.

‡ Hepp, "De la méthylacétanilide ou exalgine" (*Progrès Médical*, September 28, 1889).

all proportions in water, which renders its administration and absorption very easy; moreover, it is but little toxic. I know that it may be alleged to the discredit of this substance that it sometimes produces scarlatiniform eruptions, profuse sweats, and collapsus, even in feeble doses, and a certain number of observations may be adduced in support of this charge. But there is no medicine which has not its dangers, and I own that I am astonished when I hear some medical men say, "But the analgesic which you propose is toxic!" In fact, the greater part of our medicines are toxic, and all depends on the dose that you administer; and those same physicians who find fault with these new analgesics employ without hesitation belladonna and opium, which are far more dangerous.

It must also be borne in mind that, just as in the case of morphine and atropine, there are certain subjects who cannot tolerate even very small doses of these analgesics, but these are exceptional cases. At the same time, in regard to antipyrin, I must point out the facility with which women, and in particular young girls, become subjects of the scarlatiniform eruption when the daily quantity of three grammes is attained or exceeded. But, in reality, in the immense majority of cases, daily dosing to this extent is well supported.

This medicament diminishes the activity of the brain and spinal cord, and instead of producing that cerebral excitation so much sought for by morphiomaniacs, it the rather causes a diminution in the cerebral activity. It is especially in migraine and in the congestive neuralgias that antipyrin proves useful; it also combats the phenomena resulting from the excitation of the cerebro-spinal axis, and one of its applications (suggested by the above fact) is to the treatment of chorea, as Legroux has proposed. The effects of antipyrin in these cases are indisputable; by this I do not mean that all cases of chorea are curable by this means, but a cure is obtained in certain cases. Only it is necessary to give large doses, and to exceed four or five grammes a day, which is not without drawbacks when you are obliged to prolong the treatment. You will then often see, especially in young girls, that scarlatiniform eruption of which I have spoken, and which obliges one to suspend the treatment.

After antipyrin, and almost at an equal rank from an analgesic point of view, I place methylacetanilide; and if this methyl compound were more soluble, it would certainly deserve to occupy the first place, and this, because it is more active, and because under its influence we have never seen an eruption appear. It is well understood that only moderate doses are to be given,—25 centigrammes (4 grains), for instance, to be repeated twice a day. At the same time, in rebellious cases, Desnos has been able to increase the doses, and to give without any ill results as much as 1.50 grammes (20 grains) a day. Its insolubility obliges us to give it in potion with alcohol, and it is under this form that we ordinarily administer it.

Here are two formulæ of which I make use:

℞ Exalgine, 2.50;
Essence of peppermint, 10;
Linden water, 120;
Syrup of orange-flowers, 30.

If the patient cannot bear the taste of the peppermint, you can make use of the following formula:

℞ Exalgine, 2.50;
Tincture of orange-peel, 5;
Water, 120;
Syrup of bitter orange, 30.

A teaspoonful of either of the above potions contains 25 centigrammes (4 grains) of exalgine, and you will prescribe a teaspoonful morning and evening. The tincture and the alcoholate serve only to dissolve the exalgine, and this is the first thing to do in the preparation, before adding the other ingredients.

You may also employ capsules, but you should bear in mind that the state of solution of the medicament augments its therapeutic power.

Against the element pain, whatever may be its origin, this potion produces very active effects, and this is the case as well in the essential as in the symptomatic neuralgias,—as well in the pains of locomotor ataxia as in those of angina pectoris.

In the *résumé* of observations published by Gaudineau you will see that in thirty-two cases of neuralgia, there were only three failures; in three cases of cardialgia with anginose accessions, we obtained decided benefit in all; lastly, we have also applied exalgine to the treatment of epilepsy. In one case we obtained a cure, but it was alcoholic epilepsy, and often in this variety the removal of the cause suppresses the effect; more trials in this direction, therefore, are needed.

After exalgine I would place phenacetin, whose great insolubility gives it a rank inferior to that of antipyrin and methylacetanilide. It is this very insolubility which pre-

vents toxic effects, by allowing only a portion of the medicament to penetrate the economy at a given moment; this non-toxicity constitutes also, it must be admitted, an advantage.

Phenacetin shows itself to be especially a good medicament in the fugacious and variable neuralgias which appear so frequently in the hysterical and the neurotaxic. It is also a good analgesic, which has given in certain cases excellent results; it merits, then, in all respects, to have a permanent place in therapeutics.

Phenacetin is administered in capsules, and you may thus give daily one or two doses of 50 centigrammes (7½ grains).

I put in the last place acetanilide, not because this medicament is less powerful than the others,—quite the contrary,—but because it sometimes produces a cyanosis which frightens the patient and his attendants. This cyanosis is not particularly harmful, for acetanilide may be given for months or even years without producing any other effect than a passing, bluish discoloration of the face and mucous membranes. This medicament is very active; it is, moreover, cheap, as a kilogramme is worth only six to ten francs. It may be employed in small doses, 5 to 10 grains three times a day in capsules.

You may employ an elixir, as Yvon recommends; the inconvenience of this preparation is that it requires a great quantity of alcohol to dissolve acetanilide. Yvon's elixir consists of 5 grammes of acetanilide dissolved in 170 of elixir of Garus.

REPORT OF THREE CASES OF REMARKABLY SLOW PULSE,

TO WHICH IS APPENDED BRIEF ABSTRACTS OF NINETY-THREE CASES OF SLOW PULSE FOUND RECORDED IN MEDICAL JOURNALS IN THE LIBRARY OF THE SURGEON GENERAL'S OFFICE, WASHINGTON, D. C.*

By D. W. Prentiss, M.D.†

REMARKABLE CASE OF SLOW PULSE, EXTENDING OVER A PERIOD OF NEARLY TWO YEARS.

CASE I.—G. W. P., white male; carpenter; aged 54 years. Father died of cystitis (enlarged prostate?) at age of seventy-five years.

Mother died of cancer at age of forty-five.

Has himself always been healthy; almost never lost time from his work on account of sickness. The only illness he remembers was neuralgia of the stomach, fourteen years ago.

Has received no injuries, except a fall when nineteen years old; fell on his feet about a distance of fifteen feet; suffered no bad consequences. And ten years ago a piece of brick fell on his head, cutting the scalp, but causing no serious injury.

Never had any form of venereal disease. Has always been temperate in regard to use of alcoholic stimulants, but not so as to use of tobacco, smoking a pipe almost constantly when opportunity offered.

Have been his family physician for sixteen years. During this time was never called upon to attend him personally until the present illness, which began

December 13, 1887.—He had been building a house down in Maryland, in a malarial locality, when he began to have "weak spells," and, finally, upon lifting heavy weights, on several occasions, he fainted.

Becoming alarmed, he returned home, and I was sent for.

At this time I could find no well-defined disease. He was weak and depressed; tongue clean; no fever; mind clear; pulse 36 (there is no reason to think there had previously been anything abnormal about his pulse); urine normal; bowels constipated.

Examination of the heart discovered no organic disease. The systole was full and strong and the diastole greatly prolonged.

The following is the record of pulse and treatment from December 13, 1887, to January 20, 1888:

Date.	Pulse.	Treatment.
1887		
Dec. 13	36	Tr. digitalis. Strych., iron and quin., and bellad.
" 14	26	Digitalis stopped. Carb. am.; hyosc. and camph.
" 15	36	Digitalis was stopped on account of producing alarming faintness.
" 20	30	
" 23	26	
" 24	27	
" 26	22	
" 27	24	
" 30	26	Dr. W. W. Johnston in consultation.
1888		
Jan. 3	28	Faradic current applied to chest and back of neck. When one pole was applied to neck under ear it caused dizziness and faintness.
" 6	39	
" 13	60	
" 20	76	

* Read before the Association of American Physicians at Washington, D. C., September, 1889.

† Professor of Materia Medica and Therapeutics, Columbian University, Washington, D. C.

He had been ordered to stay in bed, but when he felt better he got up and started down-stairs. Was seized with fainting spells, in one of which he was on the stairs and fell down-stairs; in another fell out of a chair; was unconscious about one minute.

After January 20, 1888, when pulse had risen to 76, he had no more fainting spells, but continued to convalesce slowly, and in March was able to resume work. He was cautioned about over-exertion and heavy lifting, and especially not to use tobacco in any form. He could not, however, resist the temptation to take an occasional smoke.

He continued to work at intervals during the summer until October (1888), when he had a relapse, coming on with the same symptoms as the first attack.

The following is the clinical record from October 2, 1888, to April 15, 1889:

Date.	Pulse.	Remarks.
1888		
Oct. 2	36	Faint sinking spells; chills.
" 3	24	Quin. .60 (8 grs.) each morning.
A.M.		
Oct. 8	24	
" 9	18	Nitro-glyc., 2 drops every three hours.
" 10	26	Iod. and brom. potas.
" 11	30	
" 12	28	Complains of burning throughout the blood-vessels; stop nitro-glyc. Pulse has been as low as 20 per minute.
" 14	26	Nit. amyl, if necessary; pills strych., bellad., caffeine.
" 19	20	Pulse 24 since 19th.
" 23	18	No pills since Sunday.
" 26	32	Dr. A. E. Johnson's visit; fainting spells.
Nov. 14	37	
" 17	44	
" 24	36	
" 29	36	
Dec. 10	36	
" 16	40	
" 26	38	
A.M.		
1889		
Jan. 1	40	Spells; brom. of ammon. and strophanthus.
" 2	32	
" 3	36	
" 10	32	Spells every day, but generally better.
" 17	42	
" 24	40 to 60	Weaker; delirium at times.
" 31	40	No spells; sometimes delirious; not as weak; takes food.
Feb. 9	36	
" 17	30	Seems improved.
" 24	32	Flashes of heat around heart.
Mch. 3	34	
" 10	36	Better.
" 17	44	Sitting up.
" 24	18	Bad fainting spells; black in face.
" 28	20	
" 29	36	
" 31	38	
April 8	15	
" 15	38	

Improved so that he sat up and could go around the house and out for short walks; no attempt to work.

About August 1, 1889, began to have a return of old symptoms.

Date.	Pulse.	Temp.	Remarks.
1889			
Aug. 5	34	...	For a week had had frequent fainting spells, with partial unconsciousness and dyspnœa; pulse down to 12 or 15 during spells; once fell down-stairs; bromide of ammon.
" 6	36	...	
" 10	13	97°	After August 10 no more "spells." Pulse regular and strong, not double, sweating freely. Confined strictly to bed, and put on diet of boiled milk, Mellin's food, and lime-water; whiskey and camphor as stimulants.
" 11	13	95°	Had two spells.
" 12	14	97.2°	More comfortable; no spells; appetite good; sleeps well; bowels regular; urine free.
" 13	13	95°	
" 14	12	96°	Feeling better; respiration slow, but normal.
" 15	13	.....	
" 16	38	96.5°	
" 17	16	95.8°	
" 19	36	98°	Pulse at one time, after turning over in bed, up to 66.
" 21	46	98°	
" 23	36	97°	
" 25	34	97.5°	
Sept. 10	34	.....	Unconscious attacks have ceased.
" 13	34	96°	Still slight spells of faintness.
" 16	32	97°	Sitting up down-stairs.
" 18	18	94.5°	

These spells are described as follows:

They come on suddenly, without warning, often without apparent cause, sometimes following some exertion.

He faints, losing consciousness. He describes the sensation as one of utter helplessness as they attack him, and as he comes to himself when they pass off.

They last from a few seconds to half an hour. The breathing is gasping and slow, as in dying, and consciousness returns with a long drawn breath.

There is a drawing of the muscles of the arms and neck, as in stretching and yawning, but no convulsive movements.

Face and hands become first pale and then dark purplish.

There is no pain, but great exhaustion.

Says himself they are due to "stoppage of the heart."

Has great confidence in the bromide of ammon., which, he thinks, stops the attacks.

During the time his pulse was slowest—from 12 to 16—these spells were recurring almost constantly, and his wife described the condition as "terrible." She worked over him faithfully, with whiskey and camphor internally, mustard and rubbing externally, and nitrite of amyl by inhalation, but thought many times that he was dead, with the black face, gasping respiration, and pulse that seemed at times to entirely stop.

She had learned to count the pulse, and she was certain that during the spells it was often much slower than I have recorded.

The treatment of the case from the first has been rest in bed, tonics and stimulants, electricity, and bromide of ammonium, together with supporting diet. The tonics used were iron, bellad., quin., and strychnine:

		Gram.
℞	Strychniæ . . .	0 04
	Ext. bellad. . .	0 20
	Ferri pyrophos. .	3 00
	Quin. hydrochlor.	3 00

In twenty caps.

Sig.—One three times a day, after food.

These capsules were taken nearly constantly while he was under observation.

The stimulants used were whiskey, camphor, and coffee.

Digitalis was tried, but made him distinctly worse.

Nitro-glycerin seemed to help for a few doses, but later caused distress; convallaria and strophanthus were tried, with like result.

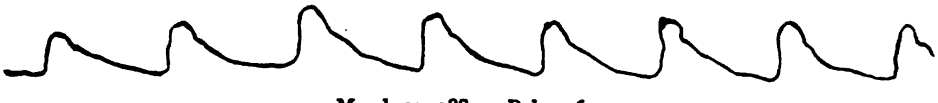
Nitrite of amyl was useful during the paroxysms in restoring consciousness.

The form of electricity employed was the faradic current,—one electrode over the heart and the other to the back of the neck. It seemed to be of decided benefit.

The drug, however, which appeared to be of most benefit was bromide of ammonium, given in doses of 1 gramme (15 grs.) three times a day, and extra doses when paroxysms threatened. He appreciates the relief from this medicine so much that he is not satisfied to be without it.

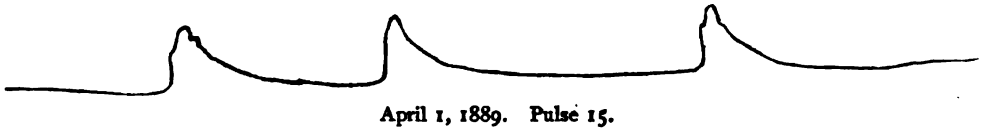
Sphygmograms in Purdy's Case of Slow Pulse, taken by Dr. R. T. Edes.

March 29, 1889. Pulse 36.

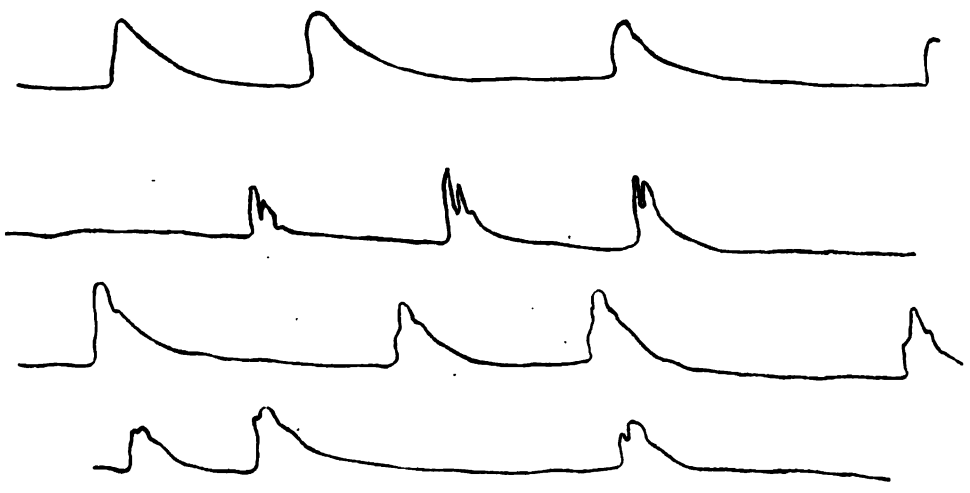


March 29, 1889. Pulse 36.

March 29, 1889. Pulse 36.



April 1, 1889. Pulse 15.



The four tracings above were taken April 7, 1889. Pulse 15.

When the above case was read before the Association of American Physicians, one of the members (Dr. S. W. Mitchell) made inquiry as to the appearance of the fundus of the eyes, and also as to whether change in position had any influence as to the rate of the pulse. The eyes were examined October 4 by the kindness of Dr. W. K. Butler, and the following is his report:

"No external changes; muscular action good; pupil reacts both to light and accommodation. No changes in the fundus; veins and arteries of normal calibre; slight venous pulsation; disks normal. Field of vision, approximately normal. Both eyes the same. Degree of vision not taken, but apparently good, as ophthalmoscope shows slight refractive error.

(Signed) "W. K. BUTLER, M.D."

Pulse was counted lying, sitting, and standing, and found the same for each position,—34 per minute.

By a curious coincidence, on the day the above case was read before the Association, an old gentleman presented himself to be examined by the members on account of a slow pulse. He was examined by several of those present, and his pulse found to be from 32 to 36 per minute. At my request he came to my office a few days later for more careful inspection. The following is a report of the case, as given by himself:

CASE II.—John T. Shepherd; nativity, New Lebanon, N. Y.; born 1806; aged 83 years. Father died at the age of fifty-five years, cause not known. Mother, at age of twenty-one years, of consumption. No brothers nor sisters. Went to sea at age of seventeen for four years. Was one month old when mother died.

Left New York for the West—Michigan—in 1831.

Was in the Black Hawk War, 1832, for thirty or forty days.

In 1833 had bilious fever, and after that fever and ague for a year.

In good health from then until 1861, when he had a fainting spell while working hard.

Was in Kenosha from 1841 to 1865, in the express business. Had frequent spells of faintness and dizziness, and finally fell in one in 1864.

Did not entirely lose consciousness.

At first, had spells once in six or eight months. In 1864, from over-exertion, he fell. Attack did not last more than one or two minutes.

On one day had fainting spells every hour. Pulse natural up to 1862. After that gradually became less, until in four or five years it was 36, and remained so.

Never had syphilis. Now in excellent health. Does not have fainting spells more than once a year.

Has been hard of hearing for fifteen years. Never had headache.

Suffers much from cold. Keeps close to the fire in winter.

Goes out but little.

Heart: valvular sounds normal; systole irregular, sort of double or treble sound; diastole prolonged; bowels regular; digestion good; sleeps a good deal; temperature under the tongue, 96°; respiration, 20; pulse same sitting or standing. Has been married three

times, last time, three years ago, at age of eighty.

Sphygmogram in Case of John T. Shepherd, taken by Dr. Robt. T. Edes, September 29, 1889.

NOTE.—While preparing this report for the printer, still another case has come under observation in my own practice.

CASE III.—Mrs. F., aged 75 years. General health has been good, excepting attacks of faintness and vertigo, to which she has been subject for three or four years. She can feel them coming on with a buzzing noise in the ears. If standing, and not able to get a seat quickly, she falls with a momentary unconsciousness. I have been consulted about them on several occasions, and directed special care about the diet and regulation of the bowels. Had not noticed any unusual slowness of the pulse until the present attack, which came on with a spell of unusual severity, October 1, 1889, at midnight. She said things looked black, had sick stomach and gagging, dizziness, and faintness, and was short of breath, but not unconscious. Felt effects all night, and remained in bed next day, complaining of severe backache.

October 2, 1889.—Pulse 35.

October 3.—Pulse 35.

October 4.—Pulse 35.

October 5.—Pulse 34.

October 7.—Pulse 36; sitting up.

Heart-sounds normal, except slight blowing sound with systole. Radial pulse and heart-beat correspond. Treatment:

℞ Potas. bromidi, 12;
Spts. æth. co., 25;
Syr. limonis, 25;
Aquæ, aa 100.

S.—Dessertspoonful in wineglassful of water every four hours, and arom. spt. of ammon., teaspoonful, as required, for a stimulant.

She is still under treatment; improving.

The most interesting question in these cases turns upon their pathology. What is the cause of this retarded action of the heart? I can but believe that it is a condition of rare occurrence, although in looking up the literature of the subject I have found a large number of cases reported under the title of "Slow Pulse," some of which correspond in many particulars with the one here presented.

The causes which produce slow pulse may be classified as follows:

1. Diseases or injuries to the nerve-centres, producing either irritation of the pneumogastric, or paralysis of the sympathetic (accelerator) nerves of the heart.

2. Disease or injury of the pneumogastric nerve, increasing its irritability.

3. Disease or injury of the sympathetic nerves of heart, paralyzing them.

4. Disease of cardiac ganglia, by which the influence of the pneumogastric nerve preponderates.

5. Disease of the heart-muscle (degeneration), whereby it fails to respond to the normal stimulus.

6. The action of poisons—as lead or tobacco—either on nerve-endings or nerve-centres. The poison generated in salt fish (Case 57).

Also the poison of certain febrile diseases,—algid pernicious fever (Case 54).

In the first case reported it is difficult to say even at this late stage to which of these divisions it belongs.

There are no symptoms to indicate any form of disease of the nerve-centres.

There is no evidence of disease in Mr. Purdy's nerves themselves, nor have we been able to discover any organic heart-disease that might account for the symptoms.

We have left, then, only the action of certain poisons; and the question presents itself whether the conditions here found may not be the result of tobacco-poisoning from excessive smoking.

This appears to me to be the most plausible explanation.

Another possibility is *malarial poisoning*. When the attack came on he was working in a very malarial district, and in the summer of 1888 he had intermittent fever, which was relieved by quinine.

These considerations make it probable that we have a paralysis of the accelerator nerves, and not an irritation of the vagus.

The symptoms presented in the case are those due solely to the defective circulation.

The syncopal attacks were the result of insufficient blood-supply in the brain, and, if long continued, must result in serious alterations of the nerve-centres, as well as of other organs, more particularly of the heart itself, by interfering with its nutrition.

In many of the cases collected in connec-

tion with this report, the pathological appearances were a result of the slow pulse rather than the cause.

In looking up the literature of "Slow Pulse" in the Library of the Surgeon-General's office, I find it more extensive than I had anticipated. And I wish here to pay a tribute to this magnificent library, and its admirable management for convenience of consultation. Without its "Index Catalogue" it would have been simply impossible for me to have brought together the cases, of which abstracts are herewith appended.

The whole number of cases given in abstract is ninety-three.

The following is a brief summary, according to the supposed causes or pathological conditions:

1. Autopsies are given in twenty-seven cases
2. Diseases of the brain, eight cases.
3. Disease or injury of the cervical vertebræ, eleven cases.
4. Epilepsy, convulsions, seven cases.
5. Heart-disease, nine cases.
6. Ossification of aortic valves and coronary arteries, three cases.
7. Starvation and exhaustion, loss of rest, convalescence, three cases.
8. Lead-poisoning, nervous shock, pernicious fever, three cases.
9. Poisoning by salt fish (?), one case.
10. Cholera morbus, indigestion, three cases.
11. Acute febrile disease, four cases; also nine cases referred to by Drs. Halpin and Mease, *Dublin Med. Journ.*, xiii., February, 1849.
12. Pericarditis, two cases.
13. Cerebral syphilis, two cases.
14. Rheumatism, one case.
15. Sunstroke, one case.
16. Not given, thirty-seven cases.

The slowest pulse was in Case LXXIX., when it fell to 3 per minute.

The next slowest pulse was in Case LXXXIII., where it fell to 4 per minute for four minutes during an attack of syncope, and once did not beat for thirty-five seconds, and again for twenty-five seconds.

The next slowest pulse was 7 per minute, in Case XXXVI.

In Case XXXVIII. it fell to 9 per minute.

In reviewing these cases of slow pulse, it is evident that the pathological conditions are very diverse, but they can probably all be referred to one or the other of the five classes given above. Dr. A. Flint, in his article on the subject in the *Amer. Pract.*, vol. xiii., 1876, very appropriately divides them into two varieties, namely:

1. Functional slow pulse.
2. Organic slow pulse.

Organic Slow Pulse, including all cases in which organic changes, principally of the nerve-centres or the heart, are evident during life or demonstrated by autopsy.

Functional Slow Pulse, embracing all cases in which no such lesions can be found.

It will be evident at a glance at the summary given above that nearly one-half of the cases belong to the "functional" division. This fact has a special significance, because it is equivalent to a confession, that in nearly one-half of the cases we are ignorant of the true cause of the condition.

The same, however, is true of many very common diseases, to which we give a name from certain groups of symptoms, as small-pox, measles, yellow fever, etc.

On the same grounds, perhaps, "functional slow pulse" may deserve the dignity of a name as a distinct disease. A large number of the cases correspond very closely in their clinical history with the case which has given a text for this paper.

Prodromes of malaise, weariness, and exhaustion. Fainting fits, with momentary unconsciousness, the pulse becoming slow, from a minimum of 3 per minute to 40 per minute, averaging from 18 to 40 per minute. The fainting fits keep pace in frequency and severity with the low rate of the pulse.

The attacks are remittent in character, lasting from a few days to several weeks, then remitting for a similar interval, to return with increased severity. The course here outlined continues until the individual dies in a syncopal attack more severe than any preceding, from utter failure of the heart to propel the blood through it.

No organic disease can be detected to account for the slow action of the heart. The symptoms observed are the result of the deficient circulation, and many of the appearances found in autopsy are from the same cause, especially where the case has been prolonged.

Treatment is purely symptomatic, and thus far has not been encouraging.

Prognosis is unfavorable. In the cases recorded all, or nearly all, have terminated fatally, death occurring from sudden syncope.

The pathology is entirely in the dark, but further study into the functions of the cardiac nerves and ganglia in their relations to

the heart-muscle promises to throw most light on the subject.

It is possible that "functional slow pulse" may be a disease of the cardiac ganglia.

Closely allied to the function of the cardiac nerve-supply also is the question of functionally rapid pulse, incidentally referred to in this paper.

CASE IV.—("Med. Commentaries," Duncan, Edin., 1793, p. 458. History of a case in which there took place remarkable slowness of the pulse.)—Man, aged 54 years; laborer; pulse 24; had fallen senseless in the street.

May 16, 1792.—Pulse 24; exhaustion, fainting, and convulsive attacks.

May 17.—Pulse 23.

May 18.—Pulse 26.

May 19, A.M.—Pulse 10, strong and regular. 3 P.M., pulse 9, constant sickness and faintness. 7 P.M., pulse 9.

Died on the 20th.

Autopsy.—Two ounces of watery fluid found in ventricles of the brain; a gelatinous appearance in some parts of the pia mater. No other cause assigned for the slow pulse.

CASE V.—(*Med. Repository*, N. W., 1809, p. 138. Dr. Malachi Foot, of New York, for Dr. Orchard Gould, of Branford, Connecticut.)—Singular case of disease, attended with retarded pulse.

June, 1808.—Jno. Smadley, aged 24 years.

After three days prodromes of oppression to breathing, sighing, respiration, and debility; there was loss of vision, and then loss of consciousness. Came on after mowing grass on a warm day and drinking freely of water (sunstroke?).

Pulse for ten days from 14 to 30 per minute. Treated by blood-letting. Recovery in two weeks.

CASE VI.—(*Medico-Chir. Trans.*, 1825, p. 202. Case of epilepsy, with remarkable slowness of pulse. Wm. Burnett, M.D.)—Naval officer; aged 46 years. Occasional attacks of epilepsy for twelve years, up to four years ago, since which time none until the present.

August 23, 1820.—Return of paroxysms.

Treatment.—Moderate blood-letting, local and general purgatives, tonics, and *small doses of pil. hydrarg.* checked them.

January 27, 1821.—Return of attacks; very frequent,—four or five in half an hour; nausea, drowsiness, etc.; same treatment.

April, 1821.—Attacks have been lighter, but complained of uneasiness and distention at epigastrium and dyspnœa; in bed; pulse 36, regular, and small.

Next day, pulse 20, and from that time until May 6 from 28 to 56 per minute.

July 2, 1821.—Pulse 56; great languor, uneasiness, and fulness about the epigastrium.

July 3.—Had a bad night; nausea, vomiting, and slight attacks of epilepsy; pulse 24; no headache; camphorated mercurial ointment, and pills of blue mass and colocynth.

July 9.—Had several slight attacks; pulse 52; no specific effect from mercury.

July 16.—Has had slight attacks; pulse 20.

July 17.—Pulse 18.

July 20.—Pulse 14.

July 21.—Pulse 14; slight paroxysms.

July 22.—Pulse irregular; paroxysms frequent and severe; pulse ranges from 24 to 74; stops during paroxysms, sometimes 7, 8, or 10 seconds.

July 24.—Pulse 18 to 16.

August 2.—Pulse 24.

NOTE.—This was probably a case of cerebral syphilis.—D. W. P.

CASE VII.—1837. Remarkable slowness of pulse in a horse. (Reported by Mr. Pope in the *Veterinarian.*)

October 17, 1835.—Mr. Pope was called to see horse belonging to Mr. Ruxton Hill, of Fiddes, Feveran. Pulse was found to be only 10 per minute, with a strong, bounding rattle, which made the whole chest shake so that it could be seen at a distance. The heart at times ceased beating, and the horse fell down. The veterinary not knowing the nature of the disease, the horse was bled, given laxatives every second day, a seton inserted behind each ear, a rowel in the chest, and this treatment continued for a fortnight, when he gradually fell off his feed. In consequence of this, the laxatives were stopped, and the pulse rose to 25. As, however, the horse was growing worse, and continued to fall down, it was decided, in consultation with other veterinarians, that the case was hopeless, and he was killed.

Autopsy.—The disease proved to be dropsy of the spine in the situation of the cervical vertebræ. On opening the spinal canal at the first and second vertebræ, a considerable quantity of water flowed from the neck, evidently from the spinal cavity. The brain and all the internal organs appeared quite healthy.—*London Medical Gazette*, vol. XI., 1837, p. 254.

CASE VIII.—(*Med. Gaz.*, Lond., vol. XXII. p. 232, N. S. Herbert Mayo, F.R.S., 1838.)—Mrs. T. H., aged 35 years; for fourteen years pulse has been slower than normal,—

from 38 to 42 per minute; otherwise in fairly good health.

CASE IX.—(*Idem.*)—Clergyman; died at age of 32 from obstruction of the bowels; previous health remarkably good; was an athlete, could climb hills, run, etc., without trouble; pulse 32, otherwise normal.

At the autopsy the aortic valves showed commencing ossification.

CASE X.—(*Idem.*)—Man, aged 67 years; pulse 28 or 29; health good; when pulse reaches 36 feels very unwell.

CASE XI.—(*Idem.*)—Man, aged 70; pulse 38 to 40; oppression of chest; swelled legs; sense of fluttering in head. Recovered under antispasmodics, and pulse came down to 28; regular; symptoms of brain-trouble later.

CASE XII.—(*Idem.*)—Case of young lady. Neuralgia of face and throat. Was denied food by the stomach; fed by rectum.

After lapse of five weeks, pulse, from 70 to 80, dropped suddenly to 35.

Food was given by the mouth, and she gradually recovered.

CASE XIII.—(*Idem.*)—A surgeon. After loss of six nights' sleep, without rest during day, pulse fell to 30 for a day or two, then rose to 40, but many years elapsed before it got back to 70.

CASE XIV.—(*Idem.*)—Man, aged 52; full habit; epileptic seizures, with transient giddiness; pulse 70 to 80. Subsequently, after repeated attacks of giddiness, the pulse fell to 34, 30, and as low as 27. There was ventricular disease. At a later date condition continues the same.

CASE XV.—(*Idem.*)—A physician, aged 62. Up to fifty-nine years of age, health good, with only two interruptions,—one of severe headaches, the other influenza,—for which he was bled. This was followed by extreme weakness of body and mind, and a year later the pulse fell to 30. After vomiting, it became normal. The next day, slow pulse returned, and never after resumed its normal frequency.

Stimulants had no effect upon it.

CASE XVI.—(*Idem.*)—Case at Guy's Hospital. Man, 40 years old; out-patient. Embarrassment of respiration supposed to be due to water in the pericardium; pulse 29 to 14. Recovered entirely in two months.

CASE XVII.—(*Lond. Lancet*, 1840–41, ii. p. 336. W. C. Worthington, Senior Surgeon Lowestoft Infirmary.) Man, aged between 40 and 50 years; pulse in health, 75 per minute. Became afflicted with dyspnœa, oppression about chest, great prostration; pulse 40, sometimes less; no valvular disease of heart.

Symptoms gradually increased for two or three years, until he died in an unusually severe attack of dyspnœa.

Autopsy.—Heart found embedded in fat, its structure blanched and softened, so that the finger could easily be pushed through its substance; valves normal.

Superior and inferior cavæ and right auricle distended with dark blood.

CASE XVIII.—(By same writer.)—Man, 70 years; normal pulse 70; pulse at this date 26; attacks of dyspnœa for three years; heart's action feeble and irregular; during fainting fits powerless; dyspnœa; pulse feeble.

In Cases XIV. and XV. no disease of the base of the brain suspected.

CASE XIX.—(*Lond. Lancet*, 1840–41, i. p. 892.)—Man, aged 60 years; attacks simulating epilepsy; pulse 17 to 23; no injury to head or neck.

In discussion, Royal Medical and Chirurgical Society, March 9, 1841, it was suggested that slow pulse might be due to disease of the arteries; also that it might be due to defective circulation in the brain.

CASE XX.—(*Lond. Lancet*, vol. ii., 1845, p. 451, W. C. Worthington, F.R.C.S., Senior Surgeon Lowestoft Infirmary, refers to a case reported five years before,—*Lond. Lancet*, vol. xl. p. 336.)—An old gentleman, aged 70 years at that time; pulse 28 to 30; was still living up to August previous; in good health, except old age; no sign of cerebral disease; pulse never exceeded 30.

A few months before death fell and fractured his leg, from which he never recovered.

Holberton endeavored to prove that slow pulse was due to disease of the medulla oblongata.

Worthington, differing from this opinion, says that slow pulse occurs independent of disease of the medulla. Due, first, to insufficient or perverted nutrition of the substance of the heart, arising from ossification of the coronary arteries. Thus, slow pulse may be regarded as a symptom of this condition.

A case is mentioned in which the pulse was 40. After death, heart was found embedded in fat, its structure generally blanched and softened, so that its substance could easily be penetrated by the finger.

Abdominal walls fatty; large quantity of granular fat in the omentum; liver congested; spleen healthy; kidneys slightly en-

larged and granular; large cysts of left kidney; pleura normal; lungs emphysematous; pericardium healthy, containing three to four ounces of transparent semen; not adherent to heart.

Heart twice its normal size; surface pale.

Pulmonary artery and valves healthy.

Right ventricle dilated, and containing a fibrinous concretion; walls slightly thickened, but not much altered in consistence; tricuspid valves healthy.

Aorta natural size; three inches from its origin was deposited a patch of ossific matter. Left ventricle dilated, thickened, and of a pale ash color, soft and friable. Mitral valve healthy. The two auricles dilated, and containing fibrinous concretions.

Coats of the coronary arteries converted into bone for about two inches from their commencement, and were of a dense structure farther on, more or less obstructing their canal.

Encephalon.—Dura mater adherent to inner table of skull; longitudinal sinus slightly thickened and devoid of blood.

At the base of the brain was an effusion of about a tablespoonful of serum. Around and in front of the pons varolii, the pia mater was slightly injected, and filamentous threads of recently formed lymph easily torn, were observed to pass between different parts at this situation. The left branch of the basillary artery was dilated and its coats thickened. The substance of the brain not changed in color. Ventricles of brain did not contain more serum than usual; choroid plexus pallid; cerebellum healthy.

London Lancet, vol. i., 1845, p. 321, T. Wilkinson King. Cases of slow pulse, illustrating the dependence of the respiration on the summit of the spinal marrow, with some reference to the use of a safety-valve.

Some lesions of the upper end of the spinal cord, the only known cause of slow pulse. T. Wilkinson King, Esq., F.R.C.S.E.

Dr. Whytt reports a case of remarkably slow pulse in second stage of acute hydrocephalus.

Andral says the pulse of apoplexy is slow; that of brain-softening sometimes slow, sometimes fast.

Pulse of narcotic poisoning (opium) and of jaundice slow.

He is not aware that any disease of the heart produces slow pulse. Mentions eighty-six cases of heart-disease, in none of which was there slow pulse.

CASE XXI.—Thos. K., aged 45; rheumatic gout; facial palsy for three years; fits like epilepsy for eighteen months; pulse 22 to 30; chest oppression; orthopnœa and palpitation. Bending the head quickly forward induced pricking in every part of the body (Bright, p. 270). Dura mater at base of brain remarkably carbonaceous; heart twice its natural size, feeble and thin.

CASE XXII.—Morgagni records case of a merchant, who, after mental troubles, had vertigo and convulsions. Pulse strong, slow, and full, two-thirds less in frequency than normal; heart found dilated.

CASE XXIII.—Girl, aged 6 years; headache, and right side convulsed: pulse 30 to 40; hydrocephalus and tubercles in left cerebrum anteriorly (Abercrombie, p. 128).

CASE XXIV.—Groom, aged 49 years; subject of headache; had received blows on head; ailing for nine months; giddy, wandering, drowsy; pulse 36 to 42, later 44 to 78.

Autopsy.—Great emaciation; sloughing of nates; brain adherent at right temple, and indurated in spots the size of a bean; heart small; right ventricle thin; valves normal (Bright, p. 355).

CASE XXV.—Worker in lead; stupor; wandering of mind; strabismus; general paralysis (Bright, 371).

CASE XXVI.—Man fell from tree on his head; head symptoms; difficult deglutition and stertor; pulse 38; recovered in three weeks.

CASE XXVII.—Child, aged 16 months; injury to nucha; remarkably slow pulse; paralysis; convulsions; died in fit; abscess at summit of medulla (Abercrombie, p. 101).

CASE XXVIII.—Man, aged 47 years; fracture between fourth and fifth cervical vertebræ; pulse 48; respiration 13; mind clear; survived seven days.

CASE XXIX.—Man, aged 20 years; fifth cervical vertebra fractured by a fall; complete palsy below; pulse between 40 and 50; lived three days (Ollivier, Obs. 9).

CASES XXX. and XXXI.—(Dupuytren mentions two cases of fatal injury to cervical medulla, attended by slow pulse and phrenic respirations ("Leçons Orales," tom. i. p. 470).

CASE XXXII.—Man, aged 33 years; fall; neck deformed, stiff, and painful; pulse 30; died on twelfth day; luxation found between fourth and sixth cervical vertebræ (*Med. Gaz.*, May, 1841).

CASE XXXIII.—Man, aged 35 years; fall; limbs palsied; pulse and respiration slow; luxation between fifth and sixth cervical vertebræ, and softening of the medulla (*Med. Gaz.*, 1841).

CASE XXXIV.—Marquis de Causan; gradually palsied over two years; pulse 30 to 40; respiration slow; induration of cervical medulla.

CASE XXXV.—Man, aged 50 years; luxated neck; pulse much slower than normal; died in forty-eight hours (*Med. Gaz.*, vol. xvii. p. 901).

CASE XXXVI.—Man, aged 64 years; fall; neck injured; almost helpless; stiffness for three years after accident; pulse previous to injury 60; fainting fits; pulse 25 to 33; gout; costiveness; dyspnœa; later pulse ranged down to 20, 15, 12, and even 7 per minute, while still conscious; two or three attacks of syncope daily; died in syncope five years after injury.

Autopsy.—Heart found large and weak; lining of ventricles thickened; mitral opening admitted three fingers; tricuspid opening five fingers; cranium unusually thin; medulla oblongata small and extremely firm; occipital foramen scarcely admitted the little finger, from enlargement of the odontoid process and the thickened ligaments anteriorly; the atlas was anchylosed to the skull; right middle cervical ganglion unusually large (*Medico Chir. Trans.*, vol. xxiv.).

CASE XXXVII.—(*Charleston Med. Journ.*, 1849, iv. p. 271. Dr. J. C. Cain, Physician to Marine Hospital, Charleston, S. C. Pseudo-apoplexy, with permanent slow pulse.)—Man, aged 45 years; admitted to hospital July 17, 1848; three years before, after exposure, uneasiness in region of heart, with fluttering; no fever. Passed off in a few days, but returned on exposure to wet weather. These symptoms continued until three years later, when dyspnœa, palpitation, and exhaustion began on making any unusual exertion.

In July pseudo-apoplectic (epileptiform?) attacks began, from which he soon recovered.

Two weeks later had another attack, when he came to the hospital.

Several seizures occurred, at intervals of a few days.

Pulse 34, falling to 28 after fit; heart-sounds otherwise normal. Attacks increased in frequency, and November 2 he died, after two fits.

Autopsy. — Mediastinum thickened and strongly adherent to the pericardium; pericardium enormously distended with a straw-colored liquid, three and a half pints; whole heart enlarged, left side more than the right; right side of heart greatly distended with blood, and large quantity of fluid and coagulated blood in both ventricles; walls of right ventricle thinner than normal; left ventricle thin at apex; muscular substance of both softened; aorta, as far as the arch, corrugated; brain healthy; dura mater slightly injected over longitudinal sinus; moderate engorgement of the meninges; minute quantity of serum in ventricles of brain.

Dr. Cain expresses the opinion that the "pseudo-apoplectic or syncopic attacks, with slow pulse, are due to certain pathological diseases of the brain and heart combined."

In Dr. Stokes's cases (*idem*) there was weak heart, with aortic murmur on the first sound.

In Dr. Adams's cases, four pseudo-apoplectic attacks, fatty degeneration of the heart was found (*idem*).

In Dr. Duggans's case there occurred twenty attacks; ventricles were found in a state of fatty degeneration, and the valves of the aorta were studded with specks of bone.

In another case there was lesion of the aortic valves, with remarkable softening of the left ventricle.

In the case of the Earl of K. (Dr. Law) there was a thickened and ossified condition of the aortic valves (*idem*).

In other cases of permanent slow pulse fatty degeneration of the heart existed (Drs. Smith and Carmichael, Dublin).

Dr. Stokes agreed with Professor Law in the opinion that the pseudo-apoplectic attacks are due to diminished or feeble circulation through the brain rather than to congestion.

The number of the fits, without paralysis or coma or dilated pupils or convulsions, precludes congestion of the brain.

Cain considers the heart to be the *fons et origo malorum* in these cases of slow pulse. The cause of death is sudden syncope as proved by its suddenness and by the distension of the cavities after death. Death from apoplexy is never sudden.

In contrast to the report of Dr. Cain is

CASE XXXVIII.—The Earl of K., in which was found extensive softening of the brain; ventricles of brain distended with fluid, and substance of left hemisphere so softened as to be of almost a creamy consistence.

NOTE.—The changes in the brain, and, perhaps, in the heart, may be a sequence to slow pulse from defective nutrition.—D. W. P.

The most Successful Treatment. — Head low; absolute rest; stimulants; nourishing food.

CASE XXXIX.—(*Lond. Lancet*, 1861, vol.

ii., N. S., p. 158, St. Bartholomew's Hospital, Dr. Farre. Slowness of the pulse, without well-marked disease to account for it.)—Wm. C., painter; aged 58 years.

May 2.—Admitted to hospital. Six weeks before had dizziness, pain in head, sinking sensation at stomach, and dyspnœa. Could walk but a short distance without stopping to rest.

Remained in the hospital six weeks, pulse ranging from 22 to 34 per minute; always regular; heart normal. Complained of nothing but debility, which soon disappeared under tonic treatment.

The reporter suggests the symptoms pointed to some insidious disease of the brain.

Though a painter, he had never been lead-poisoned. The attack, however, may have been due to lead.

Dr. Watson, "Practice of Physic," vol. i., says that the slowest pulse he ever met with was 25 per minute, in a man, 68 years old, with heart-disease and dropsy. He subsequently died suddenly.

CASE XL.—Dr. Watson also refers to a case reported in "Duncan's Commentaries," in which the pulse fell to 9 (*Med. Gaz.*, Lond., vol. xxii. p. 232, N. S., 1837–38; "Duncan's Commentaries," vol. xvii.).—Person aged 54; a fit and unconsciousness, followed by three other similar fits; violent pain in head; convulsions; pulse ranged from 9 to 24; lived two or three days after.

Autopsy.—Two ounces of watery fluid found in the ventricles of the brain, and a gelatinous appearance found in some parts of the pia mater.

CASE XLI.—(*Med. Times and Gaz.*, Lond., 1864, p. 56, Thos. B. Peacock. Remarkable slowness of the pulse, coming on during convalescence from rheumatic fever, with a murmur at base of heart considered anæmic.)—Female servant, aged 21 years.

Presented the history of a case of rheumatic fever.—Eighth day, pulse 60; twelfth day, pulse 42; fifteenth day, pulse 36, low, systolic murmur; nineteenth day, pulse 36; twenty-second day, pulse 68; thirty-third day, pulse 64, systolic murmur still audible; forty-first day, pulse 48, systolic murmur still audible; forty-eighth day, pulse 48, regular, slight murmur.

Dr. Peacock does not agree with Dr. Mayo that slow pulse may be due to general exhaustion; usually the opposite.

CASE XLII.—(*Med. Times and Gazette*, Lond., 1864, p. 31, Thos. B. Peacock, M.D., F.R.C.P.)—Had seen several cases of heart-disease in which the pulse ranged from 30 to 50 per minute. In one there was found in autopsy a circumscribed aneurism of the septum of the ventricles, with great hypertrophy and dilatation of the left ventricle.

Besides these cases.

CASE XLIII.—(*Idem;* case of unusual slowness of the pulse; signs of disease of aortic valves; occasional fits of syncope, of an epileptoid character.)—Laborer, aged 53 years; under observation six years.

June, 1857.—Cramps in legs, which travelled upward towards the heart, with syncope; followed by attacks of syncope for seven weeks. Recovered, and went to work for fifteen months.

November, 1858.—Similar attack for three weeks; sent to St. Thomas's Hospital; complained of constant sinking, with repeated attacks of syncope; great difficulty of breathing on slightest exertion. Pulse 28 to 30; respiration 20 to 24; slow pulse, due to prolonged rest between the beats; heart-sounds normal; had rheumatic fever twelve years before; moderate drinker; had not smoked of late years.

He was seen as out-patient for the next four years; pulse from 28 to 32, occasionally rose to 40, and, under excitement or active exertion, to 50 or 60. No attacks of syncope during this time, but always feeble and capable of only slight exertion.

August, 1862.—A severe attack; fell unconscious; was unable to work for six weeks.

December, 1863.—Has been at work for three months; dyspnœa on exertion; general health good; pulse 32 to 34; slight soft murmur with the systole; diastolic sound flat; whizzing sound in left ear.

CASE XLIV.—(Case II. of Peacock. Remarkable slowness of pulse for several years; occasional apoplectic or syncopal attacks; no signs of cardiac disease; sudden death; no autopsy.)—Man, aged 70 years; fair health, except slow pulse; soldier for thirty-eight years; pulse 25 to 30, in other respects normal. On one occasion an attack which was regarded as apoplectic. On another became faint and fell down unconscious. Pulse several times down to 20, once to 18, per minute.

For three years had occasional attacks of syncope; sounds of the heart presented nothing unusual; first sound short and terminated abruptly by the second; action of heart regular, rather powerful; pulse at wrist strong; percussion normal; respiration nor-

mal; no indications of cerebral disease; was seized suddenly with an attack of syncope and died; no autopsy.

In discussion, Mayo thought slow pulse might be due to ossification of the coronary arteries and atrophy, with or without passive dilatation.

Peacock could see no reason for this view. The opposite conditions have been found.

Stokes and Quain (*Med. Chir. Trans.*, vol. xxxiii.) speak of slow pulse frequently accompanying fatty degeneration of the heart, and cases are given to substantiate this statement.

Dr. Bence Jones (*Pathol. Trans.*, vol. vii., 1855 and 1856), and Dr. Ogle (*ibid.*, vol. viii., 1855 and 1856) relate cases of fibrinous degenerations of heart, with slow pulse.

In these cases of degeneration of the heart, however, slow pulse is the exception (Peacock).

Quain, in a table of fifty-one cases of heart degeneration, reports only eight in which the pulse was slow. Other reporters to the same effect.

In two cases of fibrinous degeneration reported by Dr. Ogle there was slow pulse in one.

The pulse in these cases of degeneration is more likely to be weak and irregular.

In some of the most remarkable cases there is no evidence of heart-disease whatever.

Slow pulse in aortic disease is entirely opposed to Dr. Mayo's theory that slow pulse is due to atrophy. Slow pulse is sometimes caused by or accompanies general depression, exhaustion, and reduction of strength. Two cases are mentioned where the pulse fell to 35.

In convalescence, pulse often drops below the normal, just as the temperature does.

CASE XLV.—(*Lond. Lancet*, 1872, vol. ii. p. 913, J. Burney Yeo.)—Man, aged 45 years; out-patient King's College Hospital; beating and throbbing in epigastrium, with pain and tenderness; has had four attacks of rheumatism; distinct beat found low down in the epigastrium, lower than ordinary epigastric pulsation; heart apex-beat in its normal position; pulse regular and full, but very slow, —36 to minute; over heart a very complex bruit was found. First, loud, prolonged systolic murmur, and then, immediately after, two short sounds, so that with each beat of the heart are heard three distinct murmurs,—a loud murmur (systolic); then a short, soft murmur (post-systolic); and another short, soft murmur (presystolic).

A few days later he died instantly.

Autopsy.—Pericardium adherent uniformly to every portion of the heart's surface; heart flabby and dilated; walls thin, especially right ventricle; right side distended with a clot, and left auricle distended to three or four times its natural size; mitral orifice diminished in circumference; segments of valve thickened, puckered, and adherent to each other.

Murmurs Explained. — 1. Loud systolic murmur,—a regurgitant one from the insufficiency of the mitral valve.

2. The post-systolic murmur, due to the commencement of the flow of blood from the auricle to the ventricle, through the contracted and rigid mitral valve. (Dr. G. Johnson, in the discussion, suggested that this murmur might have been aortic regurgitation.)

3. The third sound coincided with the contraction of the dilated left auricle, which slowly and with difficulty gathered force enough to complete its systole.

Why the Pulse was so Slow.—"The ventricle had to wait, as it were, on the auricle; and the auricle, owing to its great distention and the thinness of its walls, could only empty itself slowly and with difficulty. In this way the pulse was delayed, and, finally, death came from inability of the auricle to empty itself."

The epigastric pulsation was due to the adhesion of the pericardium to the diaphragm, causing the diaphragm to move with the motions of the heart.

CASE XLVI.—(*Brit. Med. Journ.*, vol. ii. p. 715, 1872, St. Thomas's Hospital, Dr. Murchison. Singularly infrequent pulse.)—Pale, gray-haired woman, aged 66 years; arcus senilis; occasional fits and loss of consciousness; pulse 26; with care a weaker beat could be felt immediately after strong beat, and then a long pause; heart normal; improved on good diet, iron, and rest.

CASE XLVII.—(*Journ. de Méd. de l'Ouest*, Nantes, 1874, p. 57, M. A. Malherbe. Note on case of remarkably slow pulse in a case of indigestion in an aged female.)—Mme. L., aged 78 years; pulse 18 to 20; syncope; marked pallor; apathy; skin covered with cold sweat.

CASE XLVIII.—(*Brit. Med. Journ.*, 1874, p. 611.)—Female, aged 69 years; shocked during siege of Paris; pulse 25; heart-sounds normal; respiration 32; resembled a person under the influence of calabar bean.

Dr. Percy Boulton considered it a case of vaso-motor neurosis. The vitality of the car-

diac ganglia being diminished by shock, a hearty meal would raise the pulse five or ten beats.

CASE XLIX.—(*Clin. Soc. Trans.*, Lond., vol. viii. p. 95, Pugin Thornton, January 26, 1875.)—Married woman, aged 20 years; suffering from acute syphilitic laryngitis, for which tracheotomy was performed; pulse at the time 40.

CASE LIII.—(*Journ. de l'Ouest*, Nantes, 1876, p. 11, Dr. E. Trastour, Prof. de Clin. Méd. à l'École de Médecine de Nantes.)—M. X., aged 74 years; algid pernicious fever; pulse 10 per minute for several hours, 20 to 25 per minute for six days; epileptiform crises; pulmonary catarrh. Death by asphyxia on the eleventh day. Pulse rose to 92 before death, which was due to progressive asphyxia.

Sphygmographic Tracings.—Mr. Thornton's Case, Clin. Soc. Trans., London, vol. viii. p. 95.

No. 1.—January 4, 1873: 20 beats per minute.

No. 2.—April, 1873: 40 beats.

No. 3.—February, 1874: 40 beats.

A few hours after operation had an epileptic fit, with convulsive movements, lasting an hour; had had a fit also one week later.

Four weeks later, after returning home, had dizziness and noises in the head, and again entered the hospital; pulse 16.

December 29, 1872.—Pulse 16, strong.

January 1 to 4, 1873.—Pulse 20.

April, 1873.—Pulse 40.

February, 1874.—Pulse 40.

February, 1875.—Pulse 48; canula removed from larynx; grown stout.

In this case the slow pulse was undoubtedly due to syphilitic disease of the nerve-centres, the exact nature of which could only be known by autopsy.

CASE L.—(*Gazette des Hôpitaux*, 1876, p. 745.)—Extreme slowness of the pulse in an old man, aged 66 years,—21 per minute. The year before was operated on for hydrocele, at which time nothing abnormal was noticed about the pulse. Heart-sounds otherwise normal. Slow pulse, due to prolonged diastole, which occupies two and a half seconds.

CASE LI.—(*Gaz. des Hôp.*, 1876, p. 788.)—Case of extreme slowness of the pulse in a man otherwise healthy,—20 pulsations per minute (letter from Dr. Vigouroux).

CASE LII.—(*Idem*, p. 845.)—An article on pulse in lead-poisoning, giving sphygmograms.

NOTE.—In this case the temperature is not given, but if the diagnosis (Fièvre pernicieuse algide) is correct, the cause of the slow pulse was probably collapse from the overwhelming of the nerve-centres by the poison of the disease.—D. W. P.

(To be continued.)

HISTORICAL, CRITICAL, AND SCIENTIFIC ASPECTS OF BROWN-SÉQUARD'S DISCOVERY—THE SO-CALLED "ELIXIR."

BY G. ARCHIE STOCKWELL, M.D., F.Z.S., DETROIT, MICHIGAN.*

THE announcements made by Professor Brown-Séquard in the Société de Biologie of Paris, on the 1st, 8th, and 22d of June last, seemingly have created no little stir in the medical and scientific worlds, besides affording opportunity for gibes and jokes that have not always been the most chaste. Certainly it would seem as if the age, standing, and exalted record of this veteran physiologist, to whom we are so deeply indebted for our present understanding of neuropathology, and knowledge of neural therapeutics, should, at least, entitle his utterances to thoughtful and respectful attention.

* Member of the New Sydenham Society, Lond.

Most unfortunately, however, in France and America more especially, the subject-matter of his communications has been seized upon by the daily and weekly secular press, and distorted and spread broadcast in an almost—sometimes quite—indecent way, under such captions as "Elixir of Life," "Juice of Rejuvenescence," "Fountain of Youth," etc., wherein Brown-Séquard is likened to Dr. Dee, John Foà, Ponce de Leon, or the witches of Macbeth, at the same time affording abundant opportunity for a large class of sensational practitioners, pseudo-medical men, and quasi-physiologists to advertise themselves and their wares at little or no expense. Of the erroneous ideas thus promulgated, and pernicious influences exerted, a fair glimpse is had by perusal of the leading articles in the majority of American medical and pharmaceutical publications, which, to an incomprehensible extent, appear to be based *solely* upon information derived from the daily press.

But what are the facts?

Simply that Brown-Séquard, in three separate communications, alike characterized by extreme modesty, and based upon twenty years of prolonged study and active experimentation, announced he had reason to believe a remedy of value, possibly of the nature of a cerebro-spinal stimulant, might exist in the secretion of certain normal glandular structures intimately associated with the reproductive apparatus and function.

Certainly, at this epoch, when new products (ptomaïnes and leucomaïnes), obtaining to animal tissues, are of almost daily discovery, there is little that is either phenomenal or strange in the foregoing announcement, except as forced through pruriency: further, definite therapeutic action has long been known to obtain to many animal structures, the sole bar to their general employment being the difficulties incident to the preparation and preservation of readily decomposable and highly nitrogenized products. It should be remembered that propylamine, ammonia, and phosphate of lime were originally of animal origin, as are cochineal, *cantharis*, musk, ambergris, castoreum, *blatta orientalis*, albumen, honey, *fel bovis*, *carbo animalis*, ingluvin, pepsin, *ol. morrhuæ*, gall-nuts, spermaceti, and a number of oils and fats. Except to degraded and impure imaginations, there is nothing sensational in the statements of the eminent physiologist and biologist, more than is contained in the announcements of Novy of the discovery in the effete products of digestion and assimilation of highly toxic alkaloids,—*cadaverine*, for instance. Further, a personal letter just received from Paris, written by a gentleman in position, by reason of his intimacy with Brown-Séquard, to know the precise facts, says:

"Professional men here, having exhausted their humor, have turned to serious consideration of the facts embodied in the announcements made to the Biological Society. Brown-Séquard is himself deeply chagrined that deliberately false construction should have been placed thereon, and that they are perverted to subserve the interests of a sensational press. Indeed, the general verdict of the profession of France is, that the venerable scientist is being ridiculed in America simply because the fluid does not possess properties *never claimed for it.* He (Brown-Séquard) simply presented to the Society the results of experiments made with the fluid in stimulating the nervous system, and, through it, relaxed forces of the economy as manifested in a few cases of senile debility, and asked his *confrères* to also experiment in order to determine the true value of the material. That the conclusions drawn have been verified by M. Variot and others of the *Académie* you are doubtless aware. Certainly nothing has ever emanated from the pen of Brown-Séquard that should entitle any utterance of his to sweeping denunciation and criticism."

Again, it must be remembered that the communications were not the results of deductions hastily drawn from careless and imperfect experimentation, but from nearly a quarter of a century of careful and conservative investigation founded upon scientific physiological basis, and historical and traditional precedents!

Those most conversant with the earlier history of civilization, and who have delved among the records of extinct nations and the so-called prehistoric Past, are well aware it is more than probable that, in matters physiological, pathological, and psychical, particularly in connection with the phenomena and mysteries of Life, the ancient philosophers were immensely our superiors. To-day we have practically returned to the theories enunciated by Aristotle three hundred years before our era, regarding conception. The records of ancient Syro-Chaldea and Egypt, the older books of the Jews, including Holy Writ and the Mishnâ, and the earlier literature of the Celestial and Indian empires, exhibit a familiarity with the pathol-

ogy, physiology, and hygiene of reproduction and gestation, including the functions and reflex influences of the generative apparatus, that is scarcely at all understood by moderns; at the same time also is observed a veneration for glandular sexual products that is not susceptible of satisfactory explanation by any nineteenth century sanitary or philosophic hypothesis.

Turning next to the history of Phallic Worship, we find ourselves at the source of all religion and science,—viz., veneration of the source of Life and of the Creative Principle. It was for direct insult to the latter, from a theologico-mystical stand-point, that the son of Judah and Sura was cursed, an anathema that procured an individualized synonyme for masturbation,—"Onanism;" and we now know it was for a relative (though by no means parallel) heretical crime that Socrates was forced to partake of the lethal draught.

It is a trite observation of Science, that "No myth or tradition is without a basis of fact!" And, accordingly, evidence is found in ancient Chemitic, Chaldaic, Hebraic, and Oriental literature that the precise (or relative) products employed by Brown-Séquard were in vogue as therapeutic agents in the earliest times, even before the days of Moses and Rameses. "Satyricon," an aphrodisiac of great activity and power in general employment in classic Greece, was of this class. In Imperial Rome it is well known also that the same, as derived from the goat and wolf, were regarded as life-giving and strengthening, enabling those partaking thereof to sustain prolonged fatigue; they were employed for the relief of all forms of nervous disorders, beside the lassitude incident to sexual excesses. They purported to be the chief ingredient of the *aquæ amatrices* hawked about the streets and sold in open market; entered into the "witch potions" affected by the libertine patrician youth as a means of renewing wasted energies; were the direct cause, by inducing an inordinate satyriasis, of the suicides of Lucretius (author of "De Rerum Natura") and Lucullus "the Epicurian;" and were accredited with enabling Caligula and Nero to sustain their prolonged sensual debauches. Likewise they were the basis of the daily draughts taken by the notorious Messalina, wife of Emperor Claudius, and administered by her to numerous lovers—"so many there was not a youth of beauty and vigor in all Rome that could not boast of her favors"—in order to stimulate them to orgies the like of which is hardly to be conceived of in these modern days.*

Again, the native physicians of the Orient†—the *powahs*, *medicine-men*, and *shams* of barbarism,‡ the Lamaistic priests, and Parsee and Mohammedan *fâqueers* and *hakims*—have in all times and ages highly esteemed these products as nerve tonics and stimulants, and made extensive use thereof, as indeed they do to-day.

It was in the Saracenic schools (which, up to the conquest of Grenada, that resulted in the expulsion of the Moors from Spain, and for more than two centuries, retarded the progress of science in Europe), the sole repositories of advanced learning of the age, that Philippus Aureolus Theophrastus von Hohenheim (1493–1541)—better known as Paracelsus, perhaps—obtained the knowledge that made him famous throughout the length and breadth of the civilized Caucasian world, and whence was derived the information that led to the compounding of elixirs and draughts that owed their efficacy solely to secretions obtained from the reproductive organs of man and mammals,§ and made a reputation for their author not yet dimmed. A physician and an alchemist, in spite of the semi-obloquy which attaches to his name, Paracelsus was undoubtedly a man of genius and learning, four centuries in advance of his time in many of the details of medicine, pharmacy, and chemistry. His faults were venial in the day in which he flourished, and pass almost unnoticed even in our own time, since,

* The editor of the *Medical Press and Circular* declares that Horace alludes to these potions in one of his odes, wherein he beseeches the witch Canidia to reveal to him the secret of the draught she was wont to obtain by crushing in a mortar pieces of flesh torn from fiery stallions! This, however, I am unable to discover after a search of both odes, epodes, and satires.

† The Celestial merchants of California carry on a considerable trade with their native land in the testicles of sea-lions, which are employed medicinally.

‡ "R. B.," writing to the *Medical News*, under the date of September 12, and remarking upon a statement in that journal that the Indians of the Northwest use a powder prepared from dried testes, adds:

"I have long known a like practice carried out by the Cheyenne Indians,—the best favored, ablest, and the bravest of all the tribes of the Rocky Mountains and Plains. The older Indians encourage the eating of raw buffalo and antelope testes [the antelope rivals the goat in salacity.—S.] by the young warriors, and maintain that the juice confers increased power in all directions, especially as regards sexual vigor and bravery."

§ "*Sperma hominis*, semen, the sperm. Of this Paracelsus makes his *homunculus*. Experience has proved it good against the imbecility of the instruments of generation."—"Salmon's Dispensatory," London, 1684.

like those of Pasteur, they consisted chiefly of theatrical enunciation and declamation, and the drawing of conclusions from imperfect experiment and erroneous data.

Apropos of the claims of Von Hohenheim may be cited the "Diasatirion" of Mesue, which is thus given in *Summula Jacobi de partibus per Alphabetum super plurimis remediis ix ipsius Mesue libris excerptis* (1540): "Sperma multiplicant confectis testiculorum vulpes, oleum amygdalorum dulcium, oleum de nuce Indica, oleum de granis sisamis, oleum de semine line."* Again, in *Hortulis Genialis*—Julii Cæsarius Baricelli, a sancto Maris doctoris medici, Genoa, 1620—is found a receipt for sexual rejuvenescence, the principal ingredient of which is the testicle of the wild boar; and a parallel prescription is offered in a work by Elzear Blaze, one hundred and twenty years later.†

During the seventeenth century we find reproductive products, as obtained from mammals, birds, and fishes, still enjoying an enviable reputation as cerebro-spinal and genital excitants; they were especially endowed with specific attributes in diseases of mucous membranes, or those due to nervous derangements, exclusive of origin in impotence and sexual excesses, such as "the falling sickness" (epilepsy), chorea, and neurasthenias. They were, however, more generally employed to restore sexual vigor and increase virility, and found a prominent place in the London Pharmacopœia as issued by the Fellows of the Royal College of Physicians in 1676, and also in Salmon's New London Dispensatory of 1684.‡

* The "*Diasatirion*" is more completely given in the "Cordic Dispensatory" of 1546. It would be spoiled by translation, hence the original is herewith appended:

℞ Secacul. albi et mundi et elixati in decocto Cicerum, quorum prima aqua, in qua decoquebantur, sit effusa, lib. I

Testiculorum vulpis unc. VIII

Radic. raphani unc. III

Rad. Luph. plani unc. II

Terantur hae tres radices posteriores et infundatur super eas lactis bubuli aut ovili tantum, ut lac duos digitos emineat, ajiciendo

Olei sesami

Butyri recentis non salti ana unc. IIII

Coquanter cum facilitate usque ad consumptionem lactis et donec omnino remollitae sint radices et habeant justam spissitudinem instar pultis crassioris, nam si aqueum quod in lacte et radicibus est non consumatur, situm contrahit hoc medicamentum. Postea ad funde omnibus hisce praedictis radicibus.

Mellis despumati optimi lib. VI

Succi Caeparum recientium lib. I β

coque omnia simul ad perfectam decoctionem deinde ab igne depone et insperge subsequentium specierum minutissimum pulverem.

Caudarium Scinccium renibus et semine unc. I

Seminis erucae

Zingiberis

Been albi

Been rubri

Linguae avis, id est semen fraxini arboris

Seminis nasturtii

Cinnamomi

Piperis longi

Seminis Bauciae

Seminis napi

Pulpae seminis Asparagi maxime recentis ana drach. III

Confice cum eis, ultimo vero adjiceantur subsequentia.

Pinearum mundatarum lib. I β

Fisticorum, id est, Pistaciorum mundatorum, unc. X

Confice et misce omnia optime et aromatica cum Moschi boni drach. I

† "If you be advanced in years, these glands (testicles of the wild boar), dried and reduced to powder, stirred into broth made from a virile cock, taken by man and wife when failing, will insure most marvellous results; children will be born every nine months, and virility and love of lust returned."

‡ The following extracts from this volume may be of interest:

"*Aper*, the boar, . . . the stones and pizzle dried, and given in powder, ʒi at a time, help weakness and barrenness. . . . *Taurus*, the bull, . . . the stones and spermatic vessels healeth dysentery and stops bleeding, . . . and the ashes thereof is the remedy the Jews use after circumcision. . . . *Canis*, the dog, . . . the testicles and secretion provoke lust. . . . *Castor*, the beaver, . . . the stones cure colic, vertigo, epilepsy, palsy, trembling, . . . revive and quicken the spirits, . . . provoke the terms. . . . *Cervus*, the deer, . . . dried and drank in wine provoke lust. . . . *Equus*, the horse, . . . excite venery and expel the after-birth. . . . *Equus Niloticus*, the hippopotamus, . . . good against the bitings of serpents. . . . *Lepus*, the hare, . . . the womb taken in powder (after the terms) causes conception. . . . *Panthera*, *Leopardus*, panther or leopard, . . . the testicle being drunk by a woman provokes the terms, and the more being often used. . . . *Sus*, the swine, . . . the testicles of a boar, given in powder with milk of a sow, help the epilepsy. . . . *Taxus*, the badger, . . . eaten with honey, stirs up lust and causes conception. . . . *Ursus*, the bear, . . . excellent against the falling sickness. . . . *Vulpes*, the wolf, . . . taken by women causes conception. . . . *Anas*, the duck, . . . the womb helps spitting of blood. . . . *Aquila*, the eagle, . . . the testicles cause venery. . . . *Buteo*, the buzzard, . . . testicles help the weakness of generation. . . . *Gallus*, the cock, . . . the testicles stir up lust, cause fruitfulness, and help fevers. . . . *Grus*, the crane, . . . the testicles and *sal Gem* and sugar help white spots in the eyes. . . . *Milvus*, the kite, . . . the testicles cause fruitfulness. . . . *Sturio*, the sturgeon, . . . their spawn increases seed and provokes lust."

[The statement regarding the ovaries of the sturgeon is reiterated regarding the roe of many fishes, and also of the milt, and in some few instances of the flesh. French Canadians hold that catfish roe and flesh, taken by a pregnant woman, insures strong, sturdy offspring; and that the ova of sturgeon and ling, gathered from the spawning-bed (after impregnation), tend to promote conception.—S.]

In the latter part of the eighteenth century these and many other animal products were dropped from the list of official remedies. Not, however, on account of evidence of any lack of therapeutic virtue and activity, as stated by the Encyclopædia Britannica (3d Scotch edition, Edinburgh, 1783), but owing to the difficulty of securing at the precise moment demanded, or of preserving unimpaired in condition fit for use. Moreover, they were too often unstable and variable in strength and standard, from ignorance of methods and seasons suitable for obtaining a proper supply. At this period, and for centuries previous, the sexual products of certain animals were employed to stimulate and reinvigorate exhausted and overserved stallions, rams, and other stock-getters, and given to mares and other creatures of the sex to provoke the œstrum or period "of heat." The same method still survives among many farriers, stock-breeders, and farmers of certain districts of Great Britain and Ireland ;* also on the continent of Europe among Gypsies, and others of the ilk that act as veterinarians among the peasantry ; and it must be admitted that such therapeutic procedures are attended with degrees of success scarcely compatible with the claims of coincidence.†

Thus it is seen that M. Brown-Séquard had some scientific basis, as well as considerable historic license, for undertaking his experimentation.

The fact is, Therapeusis is yet in its swaddling-clothes, so to speak, so far as animal products are concerned. Those that generally obtained in the past, are now replaced by vegetable or synthetical derivatives. Even the organic materia medica as it exists is now rapidly undergoing strange and wondrous transformations through the medium of applied chemistry ; and the field of research within the domain of the animal kingdom is still practically unturned, since it supplies us with but two strictly physiological remedies, neither of which are obtained as definitely organized products,—viz., *pepsin* and *pancreatin*.

Recognizing from the foregoing a basis of possibility, not to say probability, in the assumptions of the French biologist, some four months since a series of investigations and experiments were instituted, that were materially aided and furthered by the enterprise of Messrs. Parke, Davis & Co., of Detroit, who were induced to take up the matter and place it in the hands of the expert chemists of their scientific department.

As a result of repeated analyses of glandular products, such as were employed by M. Brown-Séquard and obtained from various members of the animal kingdom, was established the existence of a vital principle in the form of a leucomaïne or physiological alkaloid.‡

* "County travelling stallions are said to have stimulants given them, and to have as many as two hundred mounts in the season."—Acton, p. 182. [The stimulant here referred to is almost always spermatic secretion as obtained from various animals, preferably, however, that of the same species. The œstrual product of the mare, often employed, is deemed most efficient.—S.]

† Dr. Joseph Adolphus, of Atlanta, Georgia, writes to the *Medical Brief:*

"Many years ago I was acquainted with a physician who had achieved a wonderful reputation, and had drawn unto himself an immense patronage on account of the remarkable success had in the treatment of 'broken-down constitutions.' He told me a large share of his patients were sufferers from leucorrhœa, catarrh, constipation, etc. A constant complaint of nearly all was 'a feeling of being nearly all the time tired.' He possessed the singular faculty of winning the confidence of all who consulted him of either sex, that enabled him to draw from them all the little secrets of their lives and habits, and to unbosom themselves without reserve or fear, regarding everything he desired to know. He had engraved in his moral and intellectual constitution a profundity of philosophical inspiration that elevated his mind to planes higher than those occupied by the savants of his day; and he believed in the mysterious influences of a hidden life, a peculiar *archeus*. . . . In the matter of treatment —singularly enough it appears in the light of recent scientific research—he turned instinctively to the testicles of animals for his main medicament. It was his custom to digest the glands of rabbits, musk-rats, weasels, etc., and the fluid was administered in teaspoonful-doses to the patient while fasting, no food being allowed for two hours subsequently to the taking of the dose. This treatment was often remarkably successful in rebuilding shattered constitutions, causing agility to return to weak and laggard limbs, buoyancy of spirits to the moping, vivacity to sluggish minds, and cheerfulness to the melancholy."

‡ Messrs. Parke, Davis & Co. wish it to be distinctly understood that they are not manufacturing this alkaloid, and have no intention of so doing, unless (perhaps) forced to do so in the future by reason of accumulated evidence of value in the product, such as shall place it in the foremost rank of remedies. They undertook to examine genital products simply to discover if an alkaloidal and vital principle existed therein, and not with any view to pecuniary or trade benefits.

This note is necessitated by the fact that the publication in the *Medical Age* of a brief and incomplete report of one of the chemists (Mr. H. F. Meier), and of an editorial comment thereon by the writer, led numerous individuals to suppose this product had been, or was about to be, put upon the market by this house.

Even if it seemed desirable to manufacture, further investigations would be necessitated in order to determine, if possible, a mode of obtaining that will secure the best results, and afford the article at a price within

This alkaloid was subsequently identified as *spermine* ($C_2H_5.N$), announced by Schreiner in 1878, but heretofore considered of little moment, save as a physiological and chemical novelty. Schreiner found it not alone in the specific glandular structures, but also in the hearts and livers of calves, and upon the surfaces of morbid specimens that had been subjected to prolonged immersion in alcohol. The identity of spermine with products sometimes observed under the microscope in semen, and denominated (after the two discoverers) "Charcot-Neumann" crystals, was also made patent.

Further chemical and comparative investigations also developed the fact that the alkaloid, in the form of a salt, is more or less a product of mucous follicles; that it extensively obtains as an apparently prime constituent of gray nerve matter, being had in very appreciable quantities from brains and spinal cords of mammals, birds, fishes, reptiles, and insects; from the yelk of eggs; from oysters, mussels, cuttle-fish, cockroaches, beetles, snails; and the ova and milt of fishes. That it exists in the secretions of the prostate, of Cowper's gland, and the epididymis, as well as the sexual amygdals of males, and also in the ovaries, and the uterine, vaginal, and other sexual fluids of females (especially the glands of Bartholine or Duverney), is in no small degree corroborative of the suppositions formulated by Brown-Séquard.

Again, it is a constant feature in the waste products of all atonic mucous membranes, appearing in the expectorations of phthisis, secretions of senile and acute bronchitis, and emphysema with catarrh; in excess in the morbid secretions arising from urethritis, prostatitis, leucorrhœa, endometritis, *et al.;* and in the liver, spleen, and circulation of leucocythæmics. One of the best means of proving the latter proposition is by inducing an artificial leucocythæmia in small warm-blooded animals, such as rabbits, by the continuous prolonged administration of dimethyloxychinizin.

Certainly no little material is afforded for reflection in the fact that this product is lacking to the nervous system, and at the same time excreted to excess, in anæmias, and especially in leucocythæmia, where the ratio of white blood-corpuscles is as one to *three* against one to *three hundred and seventy-three** in health! Here spermine, comparatively speaking, abounds in its insoluble basic form in the circulation; and further evidence of the *rôle* it plays is had in the fact that, under the continuous exhibition of ferruginous hæmatics,—by which it is decomposed, forming soluble compounds,—spermine is rapidly eliminated from the circulatory system, again appearing in the gray matter of the brain and cord. This was definitely determined by a series of experiments conducted upon various creatures that were artificially made leucocythæmic by various methods.

It is a well-known physiological fact that those suffering from wasting maladies, such as tuberculosis, emphysema, pyothorax, catarrhal pneumonia ("quick consumption"), frequently fail, mentally as well as physically, in degrees altogether disproportionate to the amount of nourishment ingested and assimilated; hence causes or agencies must be sought for other than those understood by "dynamic waste," as taught and generally understood.

Again, the loss of the vital portions of the reproductive apparatus, whereby the secretion and absorption of semen (spermine) is limited, so completely transform the individuals that physiologists are forced to acknowledge that any explanation, based merely upon the loss of glandular tissue, is inadequate. Nourishment now tends to the formation of fat, instead of nerve, bone, and muscle; and, *vice versa*, a tendency to fat predisposes to impotence and sterility. Such individuals are rarely long-lived, and are lacking in brain and physical activity and finer mental organization. That similar results accrue to females under like conditions is obvious. Moreover, Keith, Glævecke, and others admit that not less than ten per cent. (some say twenty) of the women who recover from hysterectomy and oophorectomy, subsequently develop melancholia or other form of mental disorder. It is also an indisputable fact that genital affections in all classes, and in both sexes, are accompanied by characteristic cachexia, excessive pallor and waste, and a general lack of *tone*, all indicative of exhaustion of the general economy, and chiefly manifested through the central nervous system.

As has just been suggested,—and I believe it is universally admitted,—the reflex influences of the wasting diseases incident to the female organism—notably leucorrhœa and

the reach of the medical profession and consumer. Unless it can be obtained by synthesis, it would probably require to be isolated from the brains and spinal cords of mammals, and flesh and roe of fishes, procedures necessitating extraordinary trouble and waste.

* Tanner, "Practice of Medicine."

other maladies that result from improper sexual nutrition and hygiene, and from conjugal onanism, etc.—are nearly or quite as positive in their results as a violent urethritis or long-standing prostatitis in the male, and sterility, especially, is apt to supervene—indeed, is inevitable if the lues is both profuse and prolonged; and also are exhibited the usual evidences of mental and physical decrepitude.

Observe, on the contrary, the results of moderate absorption of products containing spermine; how rapidly the cachectic, chlorotic, anæmic, nervo-sanguine, blonde girl, or prematurely aged, phthisically inclined, and haggard spinster of middle life, both suffering from genital waste, by happy marriage, even if entailing unaccustomed labor and fatigue, often in great degree renew vitality, youth, health, and at the same time obtain abatement, and finally cessation, of flux, or even of dysmenorrhœa or metrorrhagia!

Spermine as a *phosphate* may be isolated directly from the seminal fluid, or from the reproductive glands; naturally the testicles of animals are the most economic source. In the former instance, the semen should be diluted with a little warm water and evaporated to dryness, then boiled with alcohol. After the insoluble portions have been permitted to subside by standing, the precipitate is filtered off, washed, dried at 100° C., and the residue triturated with warm ammonia-water, when, on subsequent evaporation, the solution yields the salt in the form of prisms and slender double pyramids, the latter being the so-called Charcot-Neumann crystals. It is soluble in dilute acids, alkalies,* alkaline carbonates; insoluble in alcohol, and nearly so in hot water. The chemical formula appears to be $(C_5H_5N)_8H_3PO_4+3H_2O$, though Ladenburg, reasoning from purely theoretical grounds, imagines it should be $C_5H_5NH_4Ca(PO_4)_2$.

If testicles are employed, those of dogs or bovines are most readily manipulated; the excess of fat found in connection with the glands of sheep is a source of no little trouble and annoyance. These are chopped fine, when the salt may be exhausted by the aid of either hydrochloric acid or aqueous ammonia. As the former chars the extract (though it does not affect the spermine), decolorization is rendered necessary, presenting the inconvenience incident to delay, and also of concentration of an acid liquid; consequently the ammonia process will be found the more desirable. All that is now demanded is to evaporate the extract to dryness, and remove the fat by the aid of ether or petroleum ether.

To obtain the *base*, the phosphate is decomposed by baryta, and the filtrate evaporated, when a colorless liquid results, that crystallizes on cooling. Positive identification of the spermine is necessary, however, as well as absolute purity, since traces of other materials are apt to adhere to the alkaloid; and as barium oxide is employed, this element should be carefully removed, as its poisonous or irritating properties are readily manifested, especially when spermine so contaminated is employed hypodermatically. From alcohol, in which it freely dissolves, the base crystallizes in hemispherical concretions consisting of fine radiated fibres, similar to Wavel's phosphate of alumina, which readily absorb moisture. The aqueous solution also is precipitated by phosphomolybdic and phosphotungstic acids, by tannin, and by gold and platinum chlorides, the two latter in a measure answering the purposes of tests for purity. The auro-chloride ($C_5H_5N.HCl.AuCl_3$) forms shining golden-yellow irregular plates easily soluble in water, alcohol, and ether, when freshly precipitated, but less so, or incompletely soluble, when dried; and the aqueous solution gives off a peculiar sperm-like odor. Recently I discovered some literature† upon

* Its solubility, that enables it to form a part of the seminal secretion, is due to the presence of, and combination with, ammonio-phosphates.

† "ETHYLENIMINE (spermine). By A. Ladenburg and J. Abel (Ber. 21, 758–766).—When heated, ethylenediamine hydrochloride is partially converted into ethylenimine hydrochloride, the reaction being best effected by heating portions of three to five grammes in small glass bulbs. The heating is stopped as soon as the contents have sublimed into the upper part of the bulb. The brown carbonaceous mass is extracted with water, filtered, and the filtrate treated with a solution of potassio-bismuth-iodide; the crystalline precipitate of the bismutho-iodide is then separated from an amorphous precipitate that falls at the same time. The yield is very small, the temperature at which the ethylenediamine hydrochloride is converted into ethylenimine hydrochloride being above that at which the latter salt begins to decompose.

"Ethylenimine, $<^{CH}_{CH}>NH(?)$, is prepared by distilling the bismutho-iodide with potash, evaporating on the water-bath, and drying under an exsiccator. The product so obtained, however, is not a base of low boiling-point, as was expected, but a white, porcelain-like mass, which deliquesces on exposure to air, with absorption of water and carbonic anhydride. It melts at 159° to 163° C. in sealed tubes; can be sublimed; is insoluble in ether; readily soluble in absolute alcohol. The

this subject, which leads to the supposition that spermine may be synthetically prepared; and since this paper was begun a letter has been received from Professor Kobert, of Dorpat, containing some interesting information, which is appended below.*

After purification, precipitation of the free base may be had from an alcoholic solution by means of hydrochloric acid, forming hydrochlorate of spermine ($C_5H_5N.HCl$), which in experiments, both within and without the physiological laboratory, proved to be the most desirable and convenient salt. It appears in the form of hexagonal prismatic plates and prisms united in tufts; is insoluble in ether, sparingly soluble in alcohol, and freely so, in all proportions, in distilled water; is not readily decomposed like the alkaloidal base, and exhibits no changes under a heat of 150° C. or less. To casual inspection it bears a striking resemblance to cocaine muriate. It may be employed subcutaneously in the same manner as the fluid that formed the base of the experiments of Brown-Séquard, and with, apparently, parallel results, or it may be given by the mouth. Inasmuch as spermine obtains in some degree in all meats, and is daily partaken of,—it is a crystalloid, and consequently dialyzable and readily absorbed,—there is no objection to its exhibition by the stomach, though, for reasons obvious, and to avoid decomposition by contact with acid secretions, it would best be administered in pill or tablet form prior to the ingestion of food, in order that its effect may be obtained chiefly within the duodenum.

For hypodermatic employment, .27 gramme of spermine muriate was dissolved in thirty cubic centimetres of either distilled-, camphor-, or chloroform-water, one cubic centimetre (about fifteen minims) representing approximately .008 gramme, or one-eighth grain of the salt.

Though already remarked that the salt is quite permanent, it nevertheless seems to deteriorate rapidly in the presence of glycerin, presumably by oxidation, dependent upon the impurities of the latter as a commercial article; hence, latterly, in experiments, the solution has been made fresh as required.

(To be continued.)

vapor density is 2.93, corresponding to the double molecular formula $<^{CH.NH.CH}_{CH.NH.CH}>$.

"There seems some reason to think that the original distillate contains the base with the simple formula; it has a faint piperine-like odor, which soon disappears, even when kept in closed vessels, and the readiness with which the base had passed over with steam would seem to point in the same direction.

"The *hydrochloride*, C_5H_5N,HCl, crystallizes in transparent tables, readily soluble in water, insoluble in alcohol. The *platino-chloride*, $(C_5H_5N)_2H_2PtCl_6$, forms small, well-formed, yellow prisms. The *auro-chloride* crystallizes in yellow, nacreous plates. The *picrate* forms small tables. The *mercuro-chloride* crystallizes in feathery groups of needles. The *bismutho-iodide*, $3CH_5N,HI,2BiI_3$, crystallizes in lustrous, garnet-red plates, insoluble in cold, decomposed in boiling, water.

"Although the evidence is not yet absolutely conclusive, there seems strong reason to think that ethylenimine is identical with the base spermine obtained by Schreiner from human semen (Abstr. 1879, 72). This point is still under investigation."—*Journal of the Chemical Society*, 1888, p. 441.

* "DORPAT, September 26, 1889.

. . . "Years ago I prepared spermine, and used it for experimental purposes. I found that in small doses it was non-poisonous. Please consult my 'Compendium of Toxicology,' published by Enke, of Stuttgart, 1887.

"Professor Böttger, who plays an important *rôle* in the history of spermine, and who has furnished the best sketches thereof, was Professor of Pathological Anatomy at Dorpat, and died here a few weeks ago.

"I beg to state that the article in the *Medical Age* has not only been read, but mention has been made in German journals because I thought the article worthy of mention. It will appear in the *Progress of Medicine*, published by Professor Unverricht in Dorpat, and Professor Eberth, of Halle."

ERYSIPELAS, AND ITS JUGULATION BY THE USE OF CAMPHO-PHENIQUE.

BY F. H. MILLIKEN, M.D., PHILADELPHIA, PA.

ON January 4 last I was called to see an infant some 18 months old that had received an injury to one of its limbs by falling from the crib a few days previously. On examining my little patient, I found the right knee swollen, inflamed, and painful to the touch. The skin was intensely red, with that livid, shining appearance so characteristic of erysipelas. The red area was irregular in shape, sending out two finger-like offshoots. The patient was restless, with considerable fever, and pulse at 140. I stated to the parents at once that erysipelas had set in, but they doubted my diagnosis, and concluded to call in another physician,—one of a different "school." This party, as I afterwards learned, treated the inflammation as one of a simple nature, due to the mechanical effects of the injury.

Two days later I was recalled to the case. During this period the erysipelas had made considerable progress, and now involved the limb half-way to the ankle. I prescribed a

weak lotion of lead-water and laudanum, and gave quinine and iron internally, but the disease made constant progress until it involved the entire leg and foot below. For three days it remained stationary, but at the expiration of this time it commenced to spread upward, and involved the lower third of the thigh. An effort was made to check its progress by painting a ring of tincture of iodine around the limb. This failing, a strong solution of nitrate of silver was tried, with no better success.

Remembering the fact that erysipelas does not advance beyond a natural crease in the skin, a cord was passed around the limb at a point where the fat made a decided crease-like depression in the integument, and was drawn sufficiently tight to produce an artificial crease. The inflammation continued to advance until it reached the line thus drawn. At the edge of the true crease it stopped, but it passed directly under the cord elsewhere, exactly as though it had not been there.

Upon consultation with another physician, who had been called in, we decided to paint a ring of iodine parallel with Poupart's ligament, but it was followed by no better results than previous efforts in this direction. The disease was stopped in its onward march by the femoral crease, where it remained stationary for two days, and again commenced its advance, creeping to the outer aspect of the thigh, attacking the skin of the abdomen at the anterior superior spinous process of the ilium, and extending until it covered a space as large as the palm of the hand, and had thrown out its finger-like advance guards much farther.

At this point I concluded to try campho-phenique, an antiseptic remedy, with which I had been "sampled" some time previously, and which until then I had not thought of, and which, perhaps, would not have occurred to me if I had not really been at the "end of my tether."* At any rate, I concluded to use it, and in doing so followed the suggestion given in the literature sent with it, and mixed it with olive oil. Thus:

℞ Campho-phenique, 2 parts;
Olei olivarum, 1 part. M.
Fiat mistura.

This was applied with a camel's-hair pencil every three (3) hours.

The result was marvellous.

At the end of the first day the bright scarlet flush had paled; at the end of the second there was but a trace of the inflammation, and even this had disappeared before the end of the third day had come to a close.

When the good effects of the first day's application of the campho-phenique (which was made over the abdomen alone) became apparent, the thigh and leg were also covered with the remedy.

The limb was carefully washed and dried, and campho-phenique 3 parts, olive oil 1 part, was applied to the thigh, and campho-phenique *pure* to the leg and foot. The skin below the knee had by this time lost its redness, and had a mottled blue appearance. It had been bathed with soap liniment in the mean time, with a view to a restoration of healthy functions. During the progress of the disease upward, an abscess had formed in the cellular tissue immediately below the head of the tibia. This was opened, and had been washed out with a bichloride solution (1 to 4000), and dressed with antiseptic gauze and cotton. The same course was pursued with other abscesses (about a dozen in number) that had formed in the course of the disease. The progress in all of them had been very unsatisfactory, and, consequently, when we decided to use campho-phenique on the surface, we concluded to try it in the abscesses as well. They were accordingly washed out, and injected with campho-phenique and olive oil (1 part of the former to 5 parts of the latter), and dressed with absorbent cotton, saturated with the same mixture and wrung out.

There was no further trouble, and the little patient made a rapid recovery. With the check of the onward march and disappearance of the eruption, there was a sudden and complete subsidence of alarming symptoms.

In two subsequent cases of erysipelas resort was at once had to campho-phenique, and the result was an immediate and complete jugulation of the disease, the first case lasting three days and the second five.

I think, therefore, that I am justified in my conviction that in campho-phenique we have a powerful and apparently sure remedy for erysipelas, and I feel that I am but performing a duty, which every physician owes his profession, in making known my experience with the remedy in question.

* Campho-phenique is stated to be a definite chemical compound, having a formula $C_{3}H_{11}O$. It is formed by rubbing up equal parts of camphor and carbolic acid. It is insoluble in water or glycerin, does not stain or discolor, and is possessed of an agreeable odor. It may be used in a diluted form mixed with cosmoline or lanoline. It is claimed to be a germicide, antiseptic, local anæsthetic, and is non-irritant.

NOTES ON ANTIPYRIN.

By W. D. Hamaker, M.D., Meadville, Pa.

Case I.—Lizzie O., aged 28. In August, 1888, about the middle of the third week of a severe case of typhoid fever, the temperature arose in the afternoon to 104⅘°. I ordered 10 grains of antipyrin to be taken at 4, 5, and 6 P.M. I was called in haste about seven o'clock, and found her in extreme collapse, sweating so that all her clothing and the bedclothes were as wet as if they had been dipped in water. Her skin was wrinkled like a washerwoman's hands. Pulse weak, and temperature 97°. Stimulants were administered, and in a few hours she had recovered partially, but it was two or three days before she entirely recovered from the effects of the antipyretic.

Case II.—Miss H., aged 35; seamstress; was quite well, with the exception of frequent headaches, caused by close application to her work. She consulted me May 15, 1889, and I prescribed a 10-grain dose of antipyrin. Soon after taking it cyanosis to a very marked degree set in, and her face, neck, hands, and arms above the elbows were quite livid and dark. I saw her in an hour, when the cyanosis had partially worn off. The skin of the face, hands, and arms was still quite blue and dusky.

Case III.—William D., August 29, 1889, on the eighth day of severe attack of typhoid fever, had a temperature at 4 P.M. of 104⅖°. At 7.30 P.M. 10 grains of antipyrin were given, and at 9.30 P.M. the temperature was reduced to 103°. The sweating which followed this small dose was so profuse that I decided that I would not give him so much again.

August 31 his temperature at 8 A.M. was 104°. At 9 A.M. *five* grains of antipyrin were administered, and at 10.30 his temperature was 101½°. At 8 P.M. the temperature had risen to 104⅘°. 5 grains were again administered, and the temperature fell gradually to 102° by 2 A.M. Temperature for several days did not go above 103⅘°, except on one occasion, and no antipyrin was given till September 5, when, the temperature having risen to 103½° at 8 P.M., 5 grains were again administered, and at 10 P.M. the temperature had fallen to 102⅘°, and at midnight to 101½°.

September 7 at 2 A.M. the temperature rose to 104⅘°; 5 grains were given, and at 4 A.M. it was 101⅘°.

September 9 at 2 A.M. the temperature rose to 104⅘°; 5 grains were administered, and at 4 A.M. his temperature had fallen to 102½°.

At noon the temperature had again risen to 104°; 5 grains given, and at 1.30 P.M. it had fallen to 102½°.

From this date there was a gradual fall of temperature, until recovery took place.

The lessons to be drawn from these cases are that some patients are very susceptible to the influence of antipyrin, and that the first doses in febrile and other cases should be small until we find out if it is tolerated. In the third case (William D.) 10 grains was an overdose, although he was a man weighing one hundred and fifty pounds, with a good, strong pulse, and just entering the second week of the disease. 5-grain doses never failed to bring his temperature down two or three degrees, and produced profuse perspiration every time.

883 Water Street.

THE LOCAL ANÆSTHETIC ACTION OF STROPHANTHUS.

By H. A. Hare, M.D.,* and G. E. de Schweinitz, M.D.†

During August of last year Steinbach contributed to the *Müncher Med. Wochenschrift* the results of a research upon the local effects of a body claimed to be not identical with strophanthin, which he extracted from the strophanthus seed. This substance, which he employed in the form of a water extract of the ether extract of the seeds, was prepared according to the following method:

Two grammes of powdered strophanthus seeds were allowed to macerate some time with fifteen grammes of ethyl ether (sulphuric ether). The ether was poured off the seeds and mixed with ten grammes of distilled water, thoroughly agitated in a flask, and then allowed to stand twelve hours in a stoppered separatory funnel. After the separation of the ether and water into layers had occurred, five grammes of the water were run off and filtered. The resulting filtrate was clear, and is the solution stated to possess

* Demonstrator of Therapeutics, and Instructor in Physical Diagnosis in the Medical Department, and in Physiology in the Biological Department, University of Pennsylvania; Physician to St. Agnes's Hospital.

† Ophthalmic Surgeon to the Philadelphia and Children's Hospitals; Ophthalmologist to the Infirmary for Nervous Diseases.

anæsthetic properties. In order to prevent the growth of micro-organisms, a few drops of a 1 to 4000 solution of mercuric chloride were added.

The solutions employed in the investigation here detailed were prepared after the manner above described.

When placed in the conjunctival cul-de-sac, Steinbach asserts that it produced complete anæsthesia, lasting from two to twelve hours. There were no great signs of irritation in animals, but if applied to the eye of the human being, it caused a slight feeling of burning, with a passing hyperæmia of the conjunctiva. This condition in animals occasionally passed on to cloudiness of the cornea. He did not obtain the same anæsthetic effects with the active principle of strophanthus that he did with the extract, and concluded that the anæsthetic substance was some body other than what is known as strophanthin. The following experiments, in which one of each class is quoted, although a great number were made, were undertaken to verify or disprove the results obtained by Steinbach:

Experiment 1. — Ether-water extract of seeds; medium-sized dog; right eye.

4.12 Three drops instilled.
4.21 Marked lessening of reflexes.
4.29 Complete anæsthesia.
4.30 Keeps eye constantly closed, as if in pain.
5.23 Complete anæsthesia.
6.41 Complete anæsthesia.

Experiment 2.—Adult male. Two drops instilled in the right eye. Severe pain, reddening, and lachrymation. At no time was there the slightest anæsthesia.

Five other patients, male and female, were similarly treated, the result in all cases being severe pain, reddening of the conjunctiva, profuse lachrymation, and, with a single exception, no anæsthesia. In the single case in which the application was followed by anæsthesia, it was difficult to determine, owing to the marked congestion, how completely the cornea and conjunctiva were lacking in sensation.

Experiment 3. — Ether-water extract of seeds evaporated to dryness at low temperature, and residue dissolved in small quantity of water. A long-haired dog, weighing eight kilos; right eye.

3.48 Three drops instilled.
4.00 No effect.
4.13 No effect.
4.27 Slightly diminished reflexes. Three more drops instilled.
4.43 Practically no effect, possibly slightly diminished reflexes.
5.05 No change from last note.

Experiment 4. — Ether-water extract of seeds, evaporated to dryness at ordinary temperature, and the residue dissolved in small quantity of distilled water. Large shepherd dog; right eye.

3.50 Three drops instilled.
4.02 No effect.
4.16 Cornea distinctly anæsthetic.
4.35 Cornea and conjunctiva completely anæsthetic.
4.46 Cornea and conjunctiva completely anæsthetic.
5.02 Complete anæsthesia of both structures continues.

On the following day the eye was still lacking in sensation.

Experiment 5.—Two and a half grains of Merck's strophanthin dissolved in one drachm of distilled water. Small black dog; right eye.

3.55 Three drops instilled.
4.08 Both eyes alike in reflex susceptibility.
4.24 Right cornea distinctly anæsthetic.
4.36 Right cornea and conjunctiva anæsthetic. Left cornea not as actively sensitive as in other dogs.
4.50 Right cornea and conjunctiva absolutely anæsthetic.

Experiment 6.—Ether-water extract. Small yellowish-brown dog; left eye.

4.40 Half a dozen drops instilled.

After waiting twenty-five minutes there was absolutely no effect.

Experiment 7.—Petroleum ether extract of Merck's strophanthin evaporated to dryness, and very slight residue dissolved in ten drops of distilled water. Black-and-tan dog of ten pounds weight; right eye.

4.27 Three drops instilled.
4.40 No result.
4.48 No result.
5.03 No result.
5.23 No result.
5.37 No result.
5.46 No result.

Experiment 8.—Second petroleum ether extract of Merck's strophanthin evaporated, and very slight residue dissolved in water. Medium-sized brown dog; right eye.

5.00 Three drops instilled.
5.20 Negative result.
5.36 Negative result.

Experiment 9.—Aqueous extract of petroleum ether extract of seeds. Petroleum ether

evaporated and residue dissolved in water. Solution very slightly bitter. Small black-and-tan dog; right eye.

4.30 Four drops instilled.
4.45 No result.
5.05 No result.
5.18 No result.
5.30 No result.

Experiment 10.—Second aqueous extract from petroleum ether extract of seeds. Petroleum ether evaporated, and very slight residue dissolved in water. Small black-and-tan dog; right eye.

5.40 Three drops instilled.
5.50 No result.
6.05 No result.
6.10 No result.

Experiment 11.—Strophantidin dissolved in thirty drops of distilled water. Small black-and-tan dog: right eye.

4.25 Four drops instilled. Dog cries out as if in severe pain. Eye not especially flushed.
4.38 No result.
4.46 No result.
4.53 No result. Three more drops instilled. Dog again cries out in pain.
5.15 No result.
5.28 No result.

Experiment 12. — Merck's strophanthin. Thirty milligrammes in one drachm of distilled water. Large brown dog; left eye.

5.50 Three drops instilled.
6.07 Complete anæsthesia.
6.10 Complete anæsthesia.

Experiment 13.—The same solution as in Experiment 12. Two adult males; right eyes.

7.30 Three drops instilled, followed almost instantly by marked flushing of the conjunctiva, redness, and lachrymation, succeeded in fifteen or twenty minutes by severe pain, lasting for a long time.

The following morning the eyes flushed, the conjunctiva swollen, and distinct supra-orbital neuralgia.

From an examination of these experiments it becomes evident that with an ether-water extract of the seeds, prepared according to the directions of Steinbach, quite complete anæsthesia of the cornea and conjunctiva may be produced in from twelve to fifteen minutes, which anæsthesia lasts for a number of hours, provided the subject of the experiment is an animal. With one possible exception, we failed to produce any anæsthetic effect in the cornea and conjunctiva of human beings. What we did produce was an amount of irritation that utterly precluded the idea of any practical value resulting from the use of this solution. In the second place, it is manifest that an equally pronounced anæsthesia in the cornea of dogs may be produced by an aqueous solution of Merck's strophanthin; that the same solution applied to the eye of a human being not only fails to produce anæsthesia, but results in an inflammation of the conjunctiva that in two of the instances was alarming. The dogs experimented upon did not appear to suffer severely, and there was no great flushing of the eye, except in three instances; two taken from among the number in the laboratory had some cloudiness of the cornea on the day following the applications. Another, a well-bred, delicately-reared pug, suffered from a large central corneal ulcer, which, for a time, threatened to destroy the sight of the eye that had been experimented upon. In the third place, it is plain that the various other extracts, as well as an aqueous solution of strophantidin, signally failed to produce any anæsthetic effect in animal's eyes. Contrary to the belief of Steinbach, we think that the ether-water extract must contain strophanthin, and that this probably is the principle in strophanthus, which produces the local anæsthesia. This research is, on the one hand, of purely pharmacological interest, inasmuch as no practical use could be made of this property of strophanthus; on the other, it may have a practical bearing in warning any other experimenters from attempting to use the local anæsthetic effect in the eyes of human beings. An interesting point, which may be referred to, is the curious fact of the almost entire failure of results in human eyes with solutions identical in composition to those which, in a brief period of time, produce absolute loss of sensation in the cornea and conjunctiva of dog's eyes, with, perhaps, the single exception of the pug-dog, in whom such great irritation was produced that it was difficult to determine whether or not the conjunctiva had become anæsthetic.

It is highly probable that the anæsthetic effects noticed by Steinbach on using the solution prepared by himself were produced by strophanthin, and not by any other principle supposed to be contained in the seeds. In the experiments detailed by us it is shown that anæsthetic effects may be produced by strophanthin (Merck's) in aqueous solution, and also when strophanthin (Merck's) is

treated with ethyl ether, the latter filtered off and agitated with water, and the water extract of the ether extract finally separated and evaporated to dryness, a residue is left, which, when dissolved in water and brought in contact with the eye, produces anæsthetic effects. This water extract of the ether extract of strophanthin possesses the peculiar bitter taste of strophanthin, showing without doubt that ethyl ether has a solvent action upon strophanthin. In preparing the solution after the manner of Steinbach,—*i.e.*, treating the seeds with ethyl ether,—the ether undoubtedly dissolves some of the strophanthin contained in the seeds, and, on extracting the ether with water, the water takes up some of the strophanthin. It may be that Steinbach overlooked this fact. Moreover, the aqueous solution thus prepared always possessed the peculiar bitter taste of strophanthin, and had more or less anæsthetic properties.

Petroleum ether was found to have no solvent action on strophanthin (Merck's), and the water extracts of the petroleum ether extracts of both Merck's strophanthin and the seeds themselves failed both in anæsthetic properties and in bitter taste.

TREATMENT OF CHRONIC URETHRITIS.

The treatment recommended by DR. SZADEK for certain cases of chronic urethritis consists in the use of sounds coated with an ointment composed of nitrate of silver, 1½ to 4½ grains; white wax, 1 drachm; lanolin, 5 drachms. The sound is allowed to remain in the urethra at first from three to five minutes, gradually increased to fifteen or twenty minutes, and repeated not oftener than every other day. When any acute symptoms are present, the treatment is contraindicated, and localized erosions or granular patches should be previously treated by means of the endoscope. Of thirty cases treated by the author in this manner during the last two years, eighteen were cured,—eleven without any other treatment, and seven with the addition of astringent injections; three were not cured, and nine were markedly benefited. Besides these, the same method of treatment was carried out in five cases of sexual neurasthenia, spermatorrhœa, and partial impotence; the result in these is not stated. In order to derive the full amount of benefit from the treatment, a period, varying from three to eight weeks, is necessary. In most of the author's cases the duration was about six weeks, but in two instances sixteen weeks elapsed before cure was effected. The sole complication that occurred was epididymitis, and that in one case only.—*London Medical Recorder*, August 20, 1889.

TREATMENT OF ALOPECIA AREATA.

DR. DUBREUILH, in the *Journal de Méd. de Bordeaux*, August 18, 1889 (*Journal of Cutaneous and Genito-Urinary Diseases*, October, 1889), speaking of treatment in *pelade*, first calls attention to the prophylactic measure laid down by Besnier in his recent report to the Academy of Medicine, in which he strongly recommends that all subjects of the disease be excluded from schools and public institutions so far as practicable.

The curative treatment is uncertain in its results. Some cases recover spontaneously in two months, while there are others that, despite the most vigorous treatment, last for months or over a year. The duration of a treated case is less than that of one left to itself. The methods of treatment are divided into two groups, according as the alopecia is of nervous or parasitic origin, and each method has been extolled to the exclusion of others, and for all the cases by the adherents of one or the other theory. Exciting frictions of all natures are recommended by the contagionists, as by those who only admit of a nervous origin.

Horand advises the application upon the bald spots of pieces of tinder soaked in croton oil left on long enough to produce vesication. If too much inflammatory reaction is brought about, the hair follicles may be destroyed and the baldness become permanent. Besnier says he has found no good results from any form of electricity. Schütz, on the other hand, has recently reported the greatest benefit in trophoneurotic alopecia by passing a current of four milliampères through each spot for five minutes at a time. Besnier thinks epilation of the borders useful. Lassar believes in the contagious nature of the disease, and has had the head washed every day with soap, followed by—

℞ Hydrarg. chl. corros., 1 part, by weight;
Glycerini,
Eau de cologne, aa 100 parts;
Aquæ destillat., 300 parts.

Then washed with a one-half per cent. alcoholic solution of naphthol, and finally rubbed with 2 parts of salicylic acid to 100 of neat's-foot oil and 3 of tincture of benzoin. The author has found benefit to result from repeated fly-blisters. As long as any trace of the affection remains, recurrence of the bald patches is to be expected.

The Therapeutic Gazette

EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

ON UNIFORMITY OF STRENGTH IN OFFICINAL PREPARATIONS.

THE near approach of the time for the meeting of the Convention for the Revision of the United States Pharmacopœia justifies, if it does not indeed necessitate, the discussion of matters directly connected with our national standard. It is hardly necessary to occupy space or time in elucidating or enforcing the importance of uniformity of strength of the more powerful drug preparations. It is important to have some preparation of each medicine so concentrated that a dose of it may be small and readily enclosed in capsule or made into pill, but it is essential to the right practice of medicine that powerful preparations be of consistent strength.

A recent occurrence in the city of Newark is an apt illustration of this. The fluid extract of conium had been prescribed for a girl, in ascending doses until characteristic physiological effects should be realized. After a time when a certain high dose had been reached the prescription was exhausted, and the druggist who originally put it up also found that his stock of the extract was used up. He therefore sent to New York and obtained the fluid extract of conium prepared by the same manufacturers who had put up the first lot. From this the original prescription was refilled, neither druggist, physician, nor patient having any reason to suppose that the fluid extract was of different strength from that originally employed; yet the same dose as had been previously tolerated caused a poisoning so severe that the life of the patient was saved with the greatest difficulty.

We have no doubt but that the fluid extracts just spoken of were identical in physical qualities, and this brings us face to face with a very important fact,—namely, that crude drugs vary greatly in their medicinal strength without varying in their physical qualities, and that it is not possible by general examination of a drug, or even by the knowledge of when, where, and how it was obtained, to positively determine its activity.

Knowing that Messrs. Parke, Davis & Co. had made elaborate researches on this subject, we have requested information from the firm as to the results obtained by their examinations. They state in substance what we have already said in regard to the varying activities of drugs and give as an example belladonna. They have assayed many hundred specimens of belladonna-leaf of first quality, and find that the percentage of total alkaloids in the drug varies from .25 to .8 per cent.,—or, in other words, that specimens apparently of similar therapeutic power really vary in the proportion of 1 to 3. They also state that not rarely those specimens which seem least promising and are least in accordance with physical perfection are of the most value; dry, shrivelled-up drugs, which can be bought upon the market at a very low figure, being often upon actual assay superior to bright green specimens for which extravagant prices are demanded.

If we cannot rely upon physical characteristics, is it possible to get standard preparations?

The law of the United States affords some answer to this. It requires that the total percentage of alkaloids in opium offered at the custom-house shall be so much; consequently, at least before it comes to this country, opium is rarely adulterated because importers fear to risk the chances of detection and the certainty of penalty if detection should occur.

It is certainly possible by chemical processes to determine the physiological value of the preparation of at least some drugs. There

are, unfortunately, powerful remedies—like cannabis indica—whose active principles have hitherto entirely eluded the chemist, and we know of no way except by physiological experiment to determine the activity of the preparation of such drugs. Extracts of hemp, alike in every physical character and also apparently alike in every chemical characteristic, vary from absolute physiological inertness to a power sufficient to produce distinct intoxication in doses of a ½ or even a ¼ of a grain. With drugs of this class we can at present do nothing to secure uniformity of strength of preparation.

There is a second class of drugs, represented by digitalis, of the active principle of which we have imperfect knowledge. Digitalin, soluble or insoluble, certainly does not represent fully the crude drug, but probably the amount of insoluble digitalin that a preparation will yield affords a test of its strength of some practical value.

The class of vegetable medicinal substances the active principle of which is alkaloidal and readily isolated is a very large one, including belladonna, aconite, veratrum viride, etc.: the strength of any preparation of these drugs the chemist can readily determine. In the new revision of the United States Pharmacopœia the committee ought not to be satisfied with the present state of affairs as regards the preparation of these drugs, but should require that the tinctures or other preparation should contain a standard percentage of alkaloids allowing variations in strength only within narrow limits. If it be thought not necessary to require this for all the preparations of these drugs, it certainly should be done for one preparation of each drug, so that the physician who desires accuracy in prescribing, by ordering this preparation can get a known amount of the alkaloid per minim or grain. To some it may perhaps seem desirable to make a new class of preparations rather than alter the strength of old preparations. This does not seem necessary, as it is just as easy to make a tincture or a fluid extract definite in strength as it is any other preparation; but, if new preparations are directed, it is of absolute importance that no name that has been used by any manufacturer should be employed to designate the new preparation. If John Smith & Company has put upon the market a so-called normal liquid, the formation of such a class of preparations by the United States Pharmacopœia would, of course, give to John Smith & Company not only great commercial renown, but also a superior commercial opportunity over its rivals, and one great danger of the present day is the capture of the Committee of the Revision by large manufacturers of drugs, of chemicals, or of medical books.

The only forcible objections which we can conceive of against the plan, as here proposed, are found in the statement that the ordinary apothecary is not skilled enough to assay alkaloidal preparations. We are not prepared to believe that this is other than a slander upon the apothecaries; but certainly if the apothecary has not such skill he is not to be trusted to make his own preparations; and even if the apothecary had to be sacrificed, would it not be better to raise up a class of men sufficiently educated than to lay aside an essential element of progress in the treatment of disease? Moreover, we very much doubt whether, in fact, many apothecaries today make their own tinctures. The manufacture of chemical and pharmaceutical preparations is now carried on in so many places, with the aid of large aggregations of capital and of business talent, that it is usually cheaper for the retail apothecary to buy than to manufacture. We are not sure that the preparation obtained from a first-class manufacturer is not usually better than that made by the apothecary himself; and if it be possible to get uniform drug-preparations only by fostering manufacturing upon a large scale, it would be preferable to stimulate such manufacture rather than to depress what seems to be a natural growth towards therapeutic accuracy.

CHLORALAMIDE.

FROM the account of fourteen cases of insomnia resulting from phthisis, enteric fever, etc., in which chloralamide was administered by Dr. D. R. Paterson (*Lancet*, October 26, 1889), it would seem that this new hypnotic is not altogether free from some of the disadvantages attendant upon those already in daily use. Doses of 30 and 45 grains have been followed by giddiness, feeling of sickness, dryness of the mouth, and even slight delirium,—symptoms which, though not alarming, are certainly disagreeable, but which seem to be inseparable from the action of almost all our sleep-producing agents. A comparison of the action of chloral with that of the amide shows that the latter is not so rapid, sleep coming on half an

hour to an hour after its administration; whereas after chloral it often results in fifteen minutes. This slight disadvantage, however, is more than compensated for by the almost entire absence of action which chloralamide has on the circulation.

This makes the drug a valuable addition to our therapeutical armamentarium in cardiac diseases or other diseases where the circulation is in any way affected.

In one of Dr. Paterson's cases—that of emphysema and dilated right ventricle—as much as 60 grains was given with good result, and no bad effect upon the heart. Dr. Paterson further confirms the general testimony as to the fact that chloralamide has no effect upon the digestive organs and that the appetite remains unimpaired. In Dr. Paterson's cases the doses ranged from 15 to 45 grains dissolved in warm water (the addition of a few drops of rectified spirits very materially increases the solubility). Careful observations were made upon the temperature, respiration, and urine, with negative result. In one instance, that of an old woman of 64, who had not slept for some time, and used to spend the night sitting up in bed, 30 grains produced on consecutive nights, after an interval of from thirty to forty minutes, a tranquil sleep of eight and nine hours respectively. On both occasions there was some giddiness on awakening, while on the second morning, in addition, she felt sick and remained drowsy during the forenoon. The dose then being reduced to 15 grains, sleep did not result on an average earlier than from half an hour to an hour and a half. It lasted, however, nearly eight hours, and was free from any of the former unpleasant after-effects; in fact, after taking half a dozen doses she stated her appetite was much better than it had been for some time.

In phthisical cases where this remedy was used, in two out of three, besides moderate insomnia, there was present copious night-sweating. The effect in checking these most troublesome and exhausting symptoms was marked in both cases. With the exception of the disagreeable after-effects already alluded to, Dr. Paterson confirms the general statements that chloralamide may be regarded as an efficient hypnotic, but whether equal to chloral or not yet remains doubtful; at any rate it seems to be comparatively free from serious injurious action, and, with the exception of the slight after-effects noted in Dr. Paterson's cases, may apparently be given with absolute safety.

Dr. Ulrich Lettow has likewise contributed to our knowledge of this substance in a report, in an inaugural dissertation, of a number of experiments made on healthy individuals and from the analysis of sixteen cases of various nervous affections in which it was used as an hypnotic. Fifty-seven single doses of chloralamide were given, of which three were given to normal individuals, the remainder to patients suffering from insomnia. The ordinary dose given amounted to but 45 grains, which in one case—that of mitral insufficiency and hypertrophy of the ventricle and arterial sclerosis—was used with great satisfaction and with no unpleasant after-effects. Doses of 15 grains were found to be without any influence, while in the majority of cases 30 to 40 grains were used with good success. In one case there was a failure,—that is, six per cent. of the writer's cases. Its action was only partially successful in three cases,—that is, 19½ per cent.; while it was eminently satisfactory in seventy-four per cent. of all cases. Chloralamide was given at different periods of the day and night: the interval between its administration and the production of sleep varied from half an hour to three hours, consequently it is somewhat slower in its action than chloral. It was administered in eight instances as an enema with a satisfactory result.

Dr. Lettow likewise failed to notice any influence on the pulse, respiration, or temperature, while the variations in the amount of urine and its specific gravity were no greater than might have been expected in a normal condition. No influence was noted upon the appetite, action of the bowels, perspiration, or any unpleasant after-effects, except in five different instances, in which in one case vomiting was produced, in two cases slight dizziness, and in two instances slight headache.

Unfortunately, the point which at present is most in need of elucidation, as to whether chloralamide possesses cumulative action or not, has not been touched upon by the author. This perhaps is owing to the small number of cases observed by him. Dr. Lettow noted in two cases an unpleasant after-taste complained of by his patients, and in certain cases the insomnia was overcome for several days after the administration of the chloralamide; further, that this remedy was best given from one hour to an hour and a half before the time when sleep is desired; that it is effective in doses of 45 grains; and that the best and most reliable mode of administration is as an enema.

TWO NEW TÆNICIDES.

IN spite of the long list of substances which have been recommended as tænicides, but few are worthy of confidence. An addition to this list of substances of one entitled to the claim of reliability cannot but be regarded as desirable. Two substances have claimed admission to this list in comparatively recent times. One of these, the areca catechu, has already been alluded to in a previous issue of the GAZETTE (March 15, 1889); the other, the fruit of the cocos nucifera, is a novelty, though it likewise received mention in the GAZETTE for December 15, 1888.

The fruit of the areca catechu, with the leaves of the piper betel, forms part of the masticatory or so-called betel nut so much used in the extreme East. The chemical composition of the areca nut has been almost unknown until very recent times. Only lately Bombelon succeeded in extracting a volatile alkaloid closely resembling nicotine which he called arecaine, and which he describes as a colorless oily body, with an odor somewhat resembling that of beef-soup, slight taste, but which becomes acrid and has a strongly-alkaline reaction. It forms salts, and among them a salicylate with an odor of tobacco. According to Bombelon, this alkaloid augments the salivary secretion and diminishes the number of cardiac beats, and also has a purgative action. Jahns, further, has isolated three alkaloids from this fruit,—one which he terms arecaline, the other arecaine, and the third which is only obtained in too small quantities to be capable of study (*Bulletin Générale de Thérapeutique*, No. 30, 1889).

The first of these, arecaline, has a composition of $C_8H_{13}NO_2$, strongly resembling the arecaine of Bombelon, is an oily liquid, strongly alkaline in its reaction, soluble in water, alcohol, ether, and chloroform. Its salts are very soluble, while all are crystalline, the bromohydrate being the most readily crystallized.

The second alkaloid, arecaine, has the formula $C_7H_{11}NO_2H_2O$, forms colorless non-deliquescent crystals, very soluble in water and diluted alcohol. It is not soluble in concentrated alcohol. It is also insoluble in ether, chloroform, and benzol. The watery solution is neutral, and has a somewhat saline taste. This alkaloid combines with acids to form crystalline salts, which are all soluble in water, less soluble in alcohol.

The arecaline is stated to constitute the active principle of the areca nut, and is the body to which its property as a tænicide is attributable; its composition and properties closely resemble pelletierine, one of the alkaloids extracted from pomegranate-bark, and which, like it, is a volatile liquid. The bromohydrate and chloro-hydrate of this alkaloid have been employed in subcutaneous and intravenous injections and even by instillation into the eye. The subcutaneous injection of ⅓ to ½ grain will kill a rabbit in a few minutes, but the ⅙ of a grain is not fatal. The symptoms of poisoning with somewhat smaller doses closely resemble those of muscarine, an alkaloid extracted from the fungus agaricus. If the dose is not so large as to be immediately fatal, it may be successfully combated by atropine. There are, however, certain differences between the action of arecaline and muscarine; areca in small doses diminishes the number of the heart-beats, and even is capable of arresting its pulsation in diastole. Its action may likewise be neutralized by atropine. Arecaline at the same time acts upon the respiration. Small doses increase the number of respiratory movements. Large doses arrest them, in fatal doses even before the heart is affected. Doses of ¾ of a grain in medium-sized dogs, given subcutaneously, produce tetanic convulsions which are followed shortly by partial paralysis, the animal being affected with vomiting and liquid evacuations in which fragments of tænia are frequently found. Small doses especially increase the peristaltic action of the intestines in cats and dogs. Further, in the physiological action of this alkaloid there is extreme contraction of the pupil, which is also produced by instillation in the eye. Arecaline may be found unchanged in the secretions and excretions, where it may be recognized by its reaction with the double biniodide of potassium and bismuth, and by the fact that those secretions containing this alkaloid possess the power of arresting the heart of a curarized frog.

It therefore appears that this is an extremely active substance, which deserves an important place in our materia medica on account of its action upon the muscles of the heart, its tænicidal and vermifugal properties, and for its peristaltic action upon the intestines.

The alkaloid, arecaine, in its physiological action upon animals and in its other properties closely resembles methyl nicotinic acid.

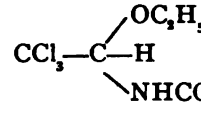
As we have previously stated, areca nuts have been recommended as a tænifuge in the form of powder in doses of 60 to 120 grains. It is claimed by Barclay that the tænia will be

expelled three or four hours after the introduction of this remedy. Other authors recommend a dose of 225 to 375 grains taken in milk after having allowed the patient to fast for twelve hours, and then following up its administration by a purgative; castor oil, infusion of senna, or any of the common purgatives may be used an hour or so after the use of the areca nut; and since the latter is more active when the intestine is comparatively empty, it is evident that the diet for a day or two preceding should have been as restricted as possible. The areca nuts are such a common article in commerce that there is no doubt but that they can be readily obtained when any demand for them is created. It is advisable, however, that a certain amount of prudence should be used in giving the dose. The amounts given above may be entirely too much, especially if the statements as to the physiological action of arecaline are even partially correct, for Jahns has stated that one-tenth of one per cent. of the crude nut is formed by the alkaloid arecaline. The dose, therefore, should not exceed 60 to 90 grains. As yet no clinical studies have been made as to the value of this alkaloid arecaline. It would seem, however, correct to look for an equivalent of pelletierine in this substance.

A second tænifuge is the fruit of the cocos nucifera, a substance which for a long time has been employed as a vermifuge in all countries where this tree is cultivated; thus in Senegal Dr. Martiallis has employed it with good results, and numerous experiments have been made in France, which seem to prove that this substance has great activity as a tænicide, and confirm the statement already made in the GAZETTE for December 15, 1888, as to the common use of this substance in India. As to whether the cocoanut contains an active principle similar to arecaline or not is still unknown, and certain observers, who have experimented with the cocoanut as a tænicide, attribute the result simply to the indigestion which is produced when large amounts of the cocoanut are taken.

ANOTHER NEW HYPNOTIC.

THE last new hypnotic has been named "somnal" by Radlauer (*Journal de Médecine*, October 20, 1889). It has a formula of $C_7H_{12}Cl_3O_3N$, and is a mixture of alcohol, chloral, and urethan. Its fusion-point is 42° C. It has been used in doses of 30 grains in the form of a solution sweetened with syrup. It is claimed to exercise no unfavorable action upon the pulse, respiration, or temperature, and by the author is stated to possess the properties of chloral and urethan without possessing their after-effects. It is stated to be unaltered by acids or silver nitrate. It has been claimed by Lutze (*Pharmaceutische Zeitung*, October 26, 1889) that the term "ethylized chloral-urethan" is simply a blind, and that the so-called new product is nothing more than chloral-urethan, or ural, under a new name. This statement has, however, evoked a denial from Radlauer (*Pharm. Journ. and Trans.*, November 2, 1889), who affirms that "somnal" is a product of the direct combination of chloral alcoholate and urethan in a vacuum apparatus, and that its composition is correctly represented by the formula—



As to whether it is any better than the other hypnotics remains to be seen.

ILLICIUM PARVIFLORUM.

AS no doubt all our readers know, the oil of anise of commerce is largely obtained from the Chinese species of Illicium. The genus comprises many species, among them *I. Floridanum*, of this country, and the *Religiosum*, or *Shikimi*, of India. The oil of shikimi contains an excessively poisonous alkaline principle, and is used in India for criminal purposes, it causing, when taken, violent epileptic convulsions with cyanosis, ending in death.

The Illicium parviflorum, as those who have read our Paris correspondence know, has within a short time been the subject of investigation and discussion before the French Academy of Medicine, and at a very recent meeting of the society Dr. E. Barral (*Revue Générale de Clinique et de Thérapeutique*, October 24, 1889) said that he had isolated a poisonous glucoside which is located in the kernel, and not in the pericarp, and that the decoction of the seed produces attacks of gastric irritation and vomiting, followed by paralysis, anæsthesia, convulsions, and death, if the dose has been sufficiently large.

Reports on Therapeutic Progress.

CREOLIN ENEMATA IN DYSENTERY.

In the *Vratch*, No. 14, 1889, p. 329, Dr. Nikolai P. Ossovsky, of Tobolsk, West Siberia, writes that the statements by Max Kortuem, Esmarch, Neudoerfer, etc., have induced him to try creolin in sixteen successive cases of epidemic dysentery of a severe description, all occurring in soldiers. The drug was used in the shape of enemata made of from five to eight fluid pounds of a half per cent. solution, and administered usually twice, but sometimes three, and even four times, daily. On each occasion the patient was placed *à la vache* (*vide infra*) with his abdominal muscles as relaxed as possible; the fluid was injected from a funnel connected by means of a long india-rubber tube with another long, soft, elastic tube inserted high up into the rectum. Of the sixteen patients, two were convalescent at the time of the communication; the remaining fourteen recovered. In nine cases, sanguinolent stools ceased on the third day of the treatment; in two, on the fifth; in one, on the sixth; in one, on the ninth; while in three they became bloodless after two enemata. The general deductions drawn by the author from his observations may be given thus: 1. High enemata made of a half per cent. creolin solution possesses unmistakably powerful disinfecting properties. 2. At the same time they appear to be by far safer (less toxic) than those of carbolic acid or corrosive sublimate (in solutions of a corresponding strength). 3. The enemata produce a hæmostatic action on the intestinal wall, while being free from any irritant local effects. 4. Acute cases, as characterized by a sudden onset of symptoms, very frequent tenesmus, and profuse bloody discharge, run a more rapid and more favorable course than subacute ones developing slowly and accompanied by mucoid stools. 5. Creolin enemata, however, fail sometimes to prevent a consecutive development of catarrh of the large bowel. In such cases, the creolin treatment should be followed by washing out the intestines with tepid water, and subsequently by high enemata made of a half per cent. solution of acetate of lead, or a one or two per cent. solution of tannic acid. A decoction of bark with Glauberian salt should be simultaneously administered internally. 6. In cases where dysentery is complicated with malaria (as it was in ten out of the author's sixteen cases), creolin enemata seem to convert a latent malarial poisoning into a typical one, as characterized by distinct febrile paroxysms. The latter usually make their appearance immediately after the cessation of the sanguinolent stools, to yield to the ordinary quinine treatment. 7. The enemata also give good results in infantile dysentery and cholera. 8. The treatment never gives rise to any unpleasant accessory effects (even when the enema is retained in the bowel for many hours). Dr. Ossovsky adds (1) that Dr. M. M. Kolokoloff, of Tobolsk, has similarly treated twelve cases of dysentery with most satisfactory results; and (2) that irrigations of surgical wounds with a two per cent. solution (emulsion) of creolin represent a powerful disinfectant means free from any drawbacks (toxic effects, local irritation, etc.).—*London Medical Recorder*, August 20, 1889.

CREOLIN.

In the *Deutsche Medizinal Zeitung* (*London Medical Recorder*, August 20, 1889) Dr. Jessner speaks, first, generally of antiseptics, and enumerates six desiderata,—viz., 1, an antiseptic must be easily soluble; 2, it must not be too volatile; 3, it must not be poisonous, killing the micro-organisms and the patient at the same time; 4, it must not be corrosive, in order that no harm may be done to the skin, mucous membrane, or instruments; 5, it must not irritate wounds, thus interfering with healing; and 6, though last, not least, it must be cheap. He then considers carbolic acid and sublimate in the light of these six points, and has to pronounce against them as antiseptics, for wounds and internal treatment, because they are both very poisonous and corrosive. Hereupon he devotes his attention to creolin, and proceeds as follows: The bacteriological works of Esmarch and Eisenberg show that a three per cent. creolin solution is at least equal to a five per cent. carbolic solution in its antiseptic value. Creolin mixes with water when simply stirred. It forms certainly no solution, but a complete and regular emulsion, which can be, therefore, made at any moment without any preparation. Creolin is not volatile. Above all, it is not poisonous in the quantities required for treatment of the human body. All experiments have proved this. A cow took 250 grammes and a dog from 30 to 50 grammes without any reaction, without even the appetite being impaired. Dr. Spaeth and others took for a length of time daily doses of 8 grammes of

creolin without any bad general symptoms or local consequences. Nay, they observed after a while favorable symptoms,—*e.g.*, decrease of intestinal gas, inodorous fæces, limitation of the putrefaction processes in the intestine, and the urine stood a long time before ammoniacal fermentation set in. From these symptoms it is clear that there is a wide field for the internal use of creolin. Involuntarily a patient of Dr. Kortüm provided a striking experiment, who, by mistake, drank 60 grammes of creolin in a five per cent. solution without experiencing any bad effects. Certainly two *probable* cases of creolin intoxication have been published, but they are by no means proved; and in one of the cases, where a septic puerpera died after syringing with creolin, it is questionable whether the drug was pure, on which everything depends. Neudörffer reports that a dog died into whose blood-vessels he had injected pure creolin. But, as Froehner clearly shows, such experiments are valueless, for such a thick foreign substance which is not soluble but only forms an emulsion may cause death by decomposing the blood or in a purely mechanical way. You may kill an animal by injecting distilled water or glycerin into the blood-vessels. Jessner does not doubt that a man may be poisoned with creolin, but he says that in the concentration and quantity in which creolin is rationally used, it may be regarded as not poisonous. When the poisonousness of a medicine is spoken of, it is to be understood relatively; for absolutely the most innocent substances may poison a man if taken in immoderate quantities. The harmlessness of creolin is particularly welcome in the treatment of children and in obstetrics. If an accident can at all happen, Jessner can imagine it possible only when a too strong concentration is introduced directly into the circulation. Well, that is a possibility that is so improbable that it need hardly be taken into consideration. It is certain, at any rate, that compared with carbolic acid and sublimate, creolin is a very safe drug. Further, creolin has not the slightest corrosive effect on either skin, mucous membrane, or instrument, even if used in a pure, undiluted form. Lately, Jessner left in his overcoat-pocket a large bottle of pure creolin, which, in his absence, his little children (aged from 1 to 3 years) pulled out, uncorked, and poured over the coat, dabbing their hands in it. Neither the children nor the coat suffered. What would have been the result had he still been in the habit of using carbolic acid as an antiseptic? [Creolin can be washed out of every material without leaving a spot, though it spoils after long application things made of india-rubber, —*e.g.*, elastic catheters.]

The skin becomes even soft and smooth after disinfecting with creolin, so that examination with the hand can be made without application of oil. The mucous membranes particularly are benefited by creolin. The vaginal mucous membrane, which is rendered hard, dry, and liable to bleed by carbolic acid and sublimate, becomes smooth, pliable, and slippery after being syringed with creolin. Diseased mucous membranes which secrete profusely are not only disinfected by creolin, but are often in a striking manner made to secrete less and to heal. The drug has also a beneficial effect on recent as well as purulent wounds, reducing the secretion, putting a stop to suppuration, and at the same time energetically helping the granulative formation. As Kortüm rightly puts it, it combines in a happy way the advantages of the energetically antiseptic effect of sublimate with those of iodoform. As to cost, the price of creolin is about one-fourth that of carbolic acid.

Other advantages are its deodorizing properties, its styptic properties, and its destructive action on parasites. Another advantage it has over carbolic acid and sublimate, and that is that it is easily distinguished by its color and smell.

Yet there are some drawbacks which, however, are of little weight compared with its advantages. The weightiest objection is the fact that the exact composition of creolin is not known. It is a mixture of many chemical combinations which it is difficult or impossible to analyze exactly. The drug is produced from creosote, and is composed, according to different chemical analysis, of 50 parts carbon hydrates, 30 parts phenol, 2 parts acids, 5 parts ashes, 5 parts water, and 8 parts other substances. The antiseptic action is most probably to be ascribed to the phenol, for of pure carbolic acid there is scarcely a trace. The drawback of this uncertainty as to the composition of creolin is that we are at the mercy of the makers, and that imitations have sprung up like mushrooms, each boldly pretending to be "the original" creolin. The consequent puffing of the drug also disgusts the professional mind. But should the uncertainty as to its composition deter us from making use of a drug which is proved to possess extraordinarily favorable properties? Nor is creolin peculiar

in wanting a clear chemical definition. For we use daily other medicines which are also mixtures of combinations, and cannot be exactly defined chemically. The composition of coal-tar and creosote is very uncertain. We find them, however, to answer certain purposes and stand certain tests, and recognize their right to a place in the Pharmacopœia. If that is enough for the practice with regard to the latter, let it suffice, too, for creolin. The best rule is to procure the drug always from the same maker. It is his interest to supply the drug in an unvarying form. Pearson's preparation is the most reliable, and German doctors cannot be accused of a want of patriotism if they cure their patients even with English creolin. Science has nothing to do with patriotism. The German preparations are not to be depended on. Latterly Pearson has brought out another preparation, creolinum purissimum, which is said to meet the objection that the emulsions of creolin keep badly, and leave resinous substances on the top, sides, and bottom of the vessels. This does not occur with the creolinum purissimum, and as soon as it is proved to be as good an antiseptic as the first creolin it will be generally adopted. By the way, it has thirty-five per cent. more phenol parts.

Another disadvantage of creolin is its want of transparency, for it is inconvenient to fish about with your instrument in a muddy fluid. But that is a matter of secondary importance. It is not necessary to dip instruments that have already been disinfected in a stronger solution, but it suffices to cover them in a shallow saucer with a thin coating of a thinner solution. Just as unimportant is the objection to the smell of creolin, which is not worse than that of carbolic acid or iodoform. By the way, a one per cent. admixture of creolin is a good deodorizer for iodoform. Until a completely harmless drug of exactly defined composition is found, possessing all the marked advantages of creolin, the latter will hold the field as an antiseptic.

TOXIC ACTION OF ZINC.

Dr. Helpup has recently undertaken some experiments, under the direction of Professor Schultz, in the Griefswald Pharmacological Institute, as to the toxic action of zinc, and has published his results in an Inaugural Dissertation. The experiments were made on rabbits and cats, and had for their object the determining of the action of zinc on the kidneys, the organs especially concerned in the elimination of this poison from the organism. Sixteen rabbits and five cats were used in these experiments. Of these, clear evidences of parenchymatous nephritis were present in nine rabbits and four cats after the administration of zinc. In some there was fatty degeneration of the renal epithelium. Hyperæmia of the kidneys occurred in four rabbits, while in two cats and two rabbits no renal change was detectable. One cat and one rabbit did not receive any zinc, in order to control the experiments, and these animals were found to be entirely free from any renal trouble. Consequently, of nineteen animals, only four escaped serious lesion of the kidneys from the administration of zinc, and therefore the author concludes that in seventy-nine per cent. of cases of poisoning by zinc, inflammation of the kidneys will be produced, while the absence of any renal complications in the other animals shows distinctly that it was the zinc which produced the lesions.

WARM BATHS IN TYPHOID FEVER.

Dr. Anuschat advocates, in a communication to the *Deutsche Medicinal Zeitung*, the employment of warm baths in typhoid fever in place of the cold water, to which the patients often evince such a great objection that they refuse to re-enter the bath. He disputes Brand's doctrine that the good effect of the cold bath is due solely to the low temperature, as in that case it would be equally advisable in all acute fevers. Dr. Anuschat believes the beneficial effect to be due to the water rather than to its temperature, and his view is confirmed by the results of one hundred and fifty cases which he has treated with the warm bath. He administers three baths daily, from fifteen to twenty-five minutes each, at 95° F. if the temperature of the body is between 100.4° and 100.2°, at 93° if the body temperature is 102.2° to 104°, and at 90.5° only if the temperature of the body is higher than 104°. In most cases a perceptible improvement takes place in three days, with decrease of fever, but the good effect of the warm-bath treatment is most plainly seen in the almost entire absence of secondary symptoms and the much shorter duration of the illness. Of one hundred and fifty patients, one hundred and forty-five were less than four weeks confined to bed, and most of them less than twenty-one days. When the

temperature of the body falls below 99.5° the bath is administered less frequently. The treatment—medicinal, dietetic, and stimulant—recommended is much the same as that generally prescribed.—*Lancet*, August 31, 1889.

HYPODERMIC INJECTIONS OF CALOMEL.

The success attending the use of calomel subcutaneously will largely depend upon the cautions which are observed during the operation. In the first place, it is necessary to render the skin of the region operated on absolutely antiseptic by the use of such fluids as corrosive sublimate or other strong antiseptics. In the second place, the fluid injected should be first sterilized, and this may be well accomplished by using a solution of calomel in salt-water when a part of the solution is transformed into corrosive sublimate. The hypodermic-needle should be plunged into boiling-water before being used. In the third place, there is considerable choice concerning the location. Shurnoff prefers the buttocks, while Besnier adopts the retro-trochanteric fossa. Among the numerous formulas which are used, a solution in salt-water is, without doubt, the best, 1 part each of calomel and sodium chloride being dissolved in 10 parts of distilled water. If rapid absorption is desired, a solution of olive oil, 1 part to 10, is preferable to saline solutions. The calomel may also be suspended in vaseline, 1 part to 10. There should always be at least a week between two subsequent injections. After the injection has been performed, the point of entrance of the needle should be compressed with either salicylated cotton, or Vigo's plaster previously warmed, or should be painted with collodion.—*Revue Générale de Clinique et de Thérapeutique*, September 12, 1889.

THE ANTITUBERCULAR POWER OF IODOFORM.

We have already in previous numbers of the GAZETTE referred to the claim advanced by various authors as to the antitubercular power of iodoform, and have likewise published statements which apparently set aside these claims as to any such action of this substance. From the stand-point of the clinician a new series of experiments is now wanted, in each of which two lesions of identical character, similarly located in the body, with identical constitutional and hygienic conditions, shall be submitted by the same observer to treatment, the one by iodoform applications, the other by the use of any other means, exclusive of iodoform, that may commend itself to the judgment of the surgeon. By comparison of the results of a considerable number of such tests, a valuable check will be furnished to aid in an estimate of the value of the experience already accumulated in various ways. Such is the plan suggested by DR. LOUIS PILCHER (*Annals of Surgery*, September 18, 1889):

As illustrating the antitubercular power of iodoform, as outlined in this paper, Dr. Pilcher reports the case of a girl, 13 years of age, whose family history was free from tuberculosis, and who presented herself to him in November, 1888, with a peculiar infiltrated and ulcerated patch on either leg, and with a smaller patch of infiltration, not ulcerated, on the outer side of each thigh. The location of the affected areas was quite symmetrical as regards the two limbs. The patches on the legs were situated anteriorly just above the ankles. Their area was sometimes larger than that of a silver dollar; a well-defined margin circumscribed each patch; and their surfaces were irregularly eroded or honeycombed by small indolent ulcers having sharply-defined overhanging borders, as if punched out and then undermined. More than three months had passed since the inception of the disease; the right ankle had been attacked first, after some time the left leg had developed the disease. Though under the treatment of an eminent specialist, no permanent improvement had been obtained, the history having been one of alternations of superficial healing and breaking down and slowly increasing infiltration. At the outset she had worn the usual garter encircling the leg above the knee; this was later replaced by elastics that passed upward on the outside of the thigh to be fastened at the waist. At the points where the greatest friction of these elastics against the outside of the thigh occurred the secondary infiltrated areas had developed. There were no varicose veins in either leg; there was no history of syphilis. The gross appearances of these various diseased patches warranted the provisional diagnosis of tuberculosis of the skin, and the opportunity which they presented to make comparative tests of treatment was taken advantage of. In the subsequent treatment the right leg patch was excised *en masse* by an incision, which traversed apparently sound tissue both at its edges and underneath it.

Subsequent examination of the part removed corroborated the diagnosis, many tuberculous nodules, pervaded by bacilli, being demonstrated throughout its central portion, especially in and about the ulcerated points. Beginning cheesy degeneration appeared in some of these nodules. The corium especially was the seat of these changes. The general structure of the mass was loose and œdematous, being infiltrated with soft granulation tissue.

The first operative attack on the disease was made December 10, 1888, at which time the patches on the thighs were excised by an oval incision. These wounds were sutured, primary union secured, and these points eliminated from further consideration. The diseased area on the right leg was also excised, as already stated, leaving an extensive surface to granulate. This was kept sprinkled over with powdered bismuth, and protected by an absorbent pad until the process of granulation was well established over its whole extent. This was somewhat slow in being secured, but, finally, at the end of six weeks, January 25, 1889, so firm and healthy a surface of granulations was presented by it that the attempt was made to secure its rapid and final healing by covering it with skin grafts, after the method of Thiersch. The immediate success of the attempt was complete, and at the end of a week definite healing of the whole seemed to have been accomplished. Soon, however, the new epithelial covering began to break down, point after point becoming necrotic and melting away, until at the end of two weeks more, bringing the history of the case up to February 13, it had largely disappeared, and an indolent ulcer, with flabby succulent granulations, had taken its place. It is important to note that at each point where the grafted skin first broke down, there was found in the tissues immediately underneath a little mass of bismuth, which had evidently become covered in by the granulation tissue in the earlier course of the healing so deeply as to escape removal by the curette when the surface was finally scraped for the application of the grafts. With the shrinking and condensation of the tissues after the successful grafting these had become forced to the surface, and had evidently so interfered with the nutrition of the overlying epithelium as to awaken a new ulcerative process.

The ulcer had now again the gross appearance of tubercular disease, and was curetted thoroughly, with a view especially to remove all retained bismuth particles. Dr. Pilcher also removed a mass from its substance of sufficient size for the examination of the pathologist, Dr. Hodenpyl, who reported that though it was made up of poorly developed granulation tissue, containing in places giant and epithelioid cells, and some aggregated masses of cells resembling tubercle tissue, repeated examinations for bacilli gave negative results. A boracic-acid ointment, with occasional stimulation by nitrate of silver, was ordered in the further treatment of the sore. At the end of another three weeks a steady but slow healing from the edges has been going on, but the process is tedious. The patient is unwilling to submit to any further curetting, or other operative procedure. Up to this time—a period of three months—no iodoform has been used upon this ulcer. It is now resorted to—March 8—by powdering it upon the granulating surface, and using an absorbent pad as a covering to the sore. After the lapse of six weeks more, when last examined, this sore is covered in over about two-thirds of its extent with a firm cicatrix, there still remaining a good sized, somewhat indolent, granulating surface.

The ulcer upon the left leg was thoroughly curetted December 10, 1888, at the same sitting with the excision of its fellow on the right leg. The curetted surface was then sprinkled with iodoform and covered by an absorbent pad. Its further history is uneventful. The same method of dressing it was continued, the pads being changed and the sprinkling with iodoform being repeated every five or seven days. It rapidly healed by the extension of a soft, firm cuticular covering from its margins. On January 25, while the patient was anæsthetized for the purpose of grafting the ulcer on the other leg, Dr. Pilcher took advantage of the opportunity to excise a wedge-shaped piece from the centre of the previously diseased area in the left leg, and submitted it to the pathologist for examination, who reported that it had the usual characteristics of primary cicatricial tissue, and was free from any evidence of tuberculosis. Recent examination of the site of this ulcer showed a firm, soft, natural skin to have been re-formed, presenting but slight traces of the former existence of any disease.

The difference in the course of these two ulcers was so marked that it could not escape the observation of even the most casual observer. The question as to the cause of this

difference is singularly free from difficulty. The hygienic and constitutional and local conditions of these ulcers were the same for each, and unusually good for both. Both were treated at the same time and by the same surgeon. The difference in their course is unmistakably due to the difference in the treatment pursued. In this case certainly a most favorable influence upon the tubercular process was exerted by the iodoform applications. Attention should not fail to be given, however, to the accessories of its employment. The grossly affected tubercular tissues were scraped away. By this proceeding the softer, more superficial layers only are removed, for no complete and radical removal of all infected tissue can be thus accomplished. What is done is to open up the deeper spaces and tissues so that they are readily permeated by the substance used for the dressings. The results obtained in the case detailed above apparently demonstrate a marked antitubercular effect from iodoform. The culture and inoculation experiments of Rovsing, DeRuyter, Neisser, and others are sufficient to show that this effect is not a direct one. But it matters not whether this effect is a direct or an indirect one. If only a sufficiently extended and carefully guarded series of clinical tests can be made to demonstrate beyond a peradventure that the further activity of the bacilli of tuberculosis can be inhibited and the rapid restoration to a normal state upon the part of infected tissues can be secured by the proper use of iodoform, then no surgeon will refuse it a place among his resources as a most invaluable antitubercular agent.

THE THERAPEUTICAL APPLICATION OF VERATRUM VIRIDE.

LIEGEOIS (*London Medical Recorder*, August 20, 1889) speaks highly of the properties of veratrum viride in palpitation of the heart due to various causes, especially in cases of functional origin. It also gives good results in palpitations associated with cardiac hypertrophy resulting from valvular or peripheral lesions. He claims that veratrum is indicated in the following conditions: 1, in functional palpitation and arhythmia, accompanied by heightened arterial pressure; 2, in palpitation and arhythmia due to organic valvular lesions during the period of hypersystole; 3, in palpitation and arhythmia during the first stage of the so-called arterial or vascular heart-disease. The alkaloid (veratrine) of white veratrum only slows the heart and lowers arterial tension when given in doses not exceeding 4 to 5 milligrammes ($\frac{1}{15}$ to $\frac{1}{12}$ grain), and this dose must be repeated every four or six hours in order to maintain the effect. Unfortunately, these doses are apt to prove extremely irritating and even emeto-cathartic. The veratrum viride, on the other hand, does not give rise to these distressing symptoms, and, like strophanthus, may be given for weeks together, if a sufficient interval be allowed to elapse between each dose, and, provided that the dose be not excessive, no cumulative effect is produced, and tolerance is not established.

THE USE AND ABUSE OF ANTISEPTIC INJECTIONS IN OBSTETRICAL PRACTICE.

A paper with the above title was read by DR. H. J. GARRIGUES at the last annual meeting of the American Gynæcological Society (*New York Medical Journal*, September 28, 1889). If, he said, one was satisfied that puerperal fever in any given case was the result of infection, the use of antiseptic injections was indicated. Like all other useful measures, this had sometimes been carried to extremes. The other extreme was reached by those who discarded injections after labor altogether. Much mischief was undoubtedly done by injections when they were not needed,—as, for example, when they were used too frequently, of too great strength, etc. At the Maternity Hospital, at Blackwell's Island, from 1874 to 1885, the mortality had been 4.17 per cent. During the period from 1884 to 1888, in which the author's method of treatment had been followed at the same institution, there had been but two fatal cases, or a mortality of a fraction of one per cent. The morbidity also had been small. Vaginal injections before delivery were believed by the author to be useful, though they were objected to by many writers on the ground that they were dangerous, that the lubricating mucus of the vagina was removed, etc. In answer to the objections that the bacteria on the surface of the vaginal mucous membrane were harmless, it must be remembered that they would not be harmless if they penetrated the subjacent tissues. They would also constitute an element of danger when carried from the vagina into the womb. If vaginal injections were used prior to labor, the vagina would be dilated and the micro-

organisms removed or destroyed. It must not be forgotten, too, that during labor a new supply of mucus was secreted to replace that which might have been washed away. In cases in which, for any cause, frequent examinations were required during labor, vaginal injections should be repeated as often as every three hours, and, if instruments were required or the hand was introduced into the uterus, both uterine and vaginal injections would be required. Such injections were better than intrauterine applications of antiseptic material with a swab, which was recommended by some. Infection would not occur if the labor had been antiseptic. Subsequent to labor, if the lochial discharge became fetid, another indication for intrauterine irrigation would exist, likewise if *débris* were left in the uterus, if there had been sloughing as the result of prolonged labor, if the fœtus had been macerated, etc. Puerperal peritonitis should be treated with such injections as soon as it was recognized, and such treatment might also be required after abortion. As to the proper material for injections, solutions of bichloride of mercury might be used, but they should be used with great caution. Since 1884 reports of twenty-two fatal cases from the use of such injections had been reported, though it must be admitted that four of this number should not be considered, and in others the solution had been too strong, or had been too frequently used, or had been improper in some other way. The strength of the mercurial solution should not exceed 1 to 5000, and its use should immediately be withheld if toxic symptoms were apparent. Some of the contraindications to its use were anæmia, kidney-disease, and diarrhœa. Other solutions had also been extensively used for this purpose, especially that of carbolic acid. The objection to this was that its odor was offensive to many, it benumbed the hands, and might produce severe results to the patient's entire nervous system. Thymol, salicylic acid, chloride of zinc, hydronaphthol, and various other substances had advocates. The author had made extensive trial of creolin, and had been well pleased with the results. In two per cent. solutions it was, perhaps, as useful and as unobjectionable as anything that had been tried. Objections to its use were that its agreeable odor might mask offensive odors which would lead to the discovery of important conditions; also that, as it formed an opaque emulsion and not a transparent fluid, it might conceal particles the presence of which it would be desirable to ascertain. It had also valuable lubricating and hæmostatic properties. If vaginal douches alone were to be given, the author preferred to use a glass vaginal tube six inches long. If the solution was to be carried into the uterus, a single tube was preferable to a double one, and it should be carefully guided into the uterus with the fingers, great pains being necessary to avoid forcing any fluid or uterine *débris* into the Fallopian tubes. The patient, while receiving the injection, should be on the back, on a bed-pan, or a rubber cloth so folded that it would catch and carry away all fluid as it returned from the vagina. The tube must not be forced into the uterus, but must be withdrawn and reintroduced if obstruction was encountered. Failure to observe this precaution had resulted in perforation of the uterus and injection of the bichloride solution into the abdominal cavity. The temperature of the uterine douche should not exceed 110° to 115° F., and the quantity should not be greater than two or three pints. For vaginal douches there would be no objection to using from two to three quarts. The return fluid should be carefully examined for septic matter, the uterus should be compressed after the irrigation was completed, and no fluid should be allowed to remain in the vagina.

Dr. W. T. Lusk, of New York, agreed entirely to the fundamental principle of the paper, which he understood to mean the advocacy of prophylactic vaginal injections. He also believed that all cases of septic puerperal fever which called for irrigation were the result of insufficient precautions on the part of the attending accoucheur. Of course this did not apply to diseases in which the virus was not introduced through the vagina. The best results from uterine injections were obtainable in cases in which there was infection from putrid matter, decayed blood-clot, etc. In septicæmia, in which round bacteria constituted the infecting agent, injections did no good, and probably did harm if used after the microbes had passed into the lymphatic circulation. In general, he believed that one thorough uterine irrigation, followed by the use of an intrauterine iodoform-pencil, was all that was serviceable. Injections repeated as often as once in three hours were improper and likely to be injurious. He did not believe that one could depend upon the odor from offensive discharges as a guide for the administration of uterine injections, as had been frequently asserted. In fact, the most offensive dis-

charges might proceed from simple puerperal catarrhal endometritis. In New York practice, he believed, many cases of supposed puerperal fever were in reality cases of typhoid fever proceeding from defective sanitation. Especially was this true in tenement-house practice. The method of treating puerperal fever which was practised by Doléris and his followers, which consisted in curetting the uterine mucous membrane and then irrigating, was to be recommended in some cases.

Dr. H. C. Coe, of New York, had followed the method prescribed by the reader of the paper with satisfactory results. He found it very difficult, however, to distinguish those cases which were suitable for irrigation from those in which it was contraindicated, in view of the fact already referred to by Dr. Lusk that the infectious elements might have passed beyond the reach of the injection. He had obtained good results from the use of creolin, but had also observed that it sometimes masked the odor of the discharges. He believed that prophylaxis was all-important in the treatment of puerperal cases.

Dr. W. M. Polk, of New York, endorsed the principle advocated by the author, but, as to the details, his custom was somewhat different. He first washed the genitals externally and internally with potash soap and hot water, and then used an injection of bichloride of mercury, 1 to 5000, or creolin. He had not yet decided which of the two solutions was preferable. He believed it a fact that suppuration in the uterine cavity should be treated in the same manner as suppuration in any other cavity. His habit was to place the patient on the left side, carefully swab out the vagina and uterus with cotton, give the injection, and then introduce iodoform gauze for drainage. There was usually no necessity of repeating the irrigation,—certainly not within a day or two.

PEMPHIGUS.

According to the Vienna correspondent of the *Medical Press* (September 11, 1889), Professor Kaposi has recently had an exceptional number of cases of this disease before his clinic. To elucidate his lectures, he selected four extreme cases as a paradigm for his remarks. His first was pemphigus without bullæ, which he designated pruriginosus; the second with large bullæ; a third having only large arythematous spots; and a fourth having small blebs. He admitted the difficulty of classifying the varieties, as those already described by different authors exceeded ninety different sorts. It will be seen by these four types shown that the degrees are so wide that any one unacquainted with the subject would class them as distinctly different diseases. Generally speaking, there ought to be only one form of pemphigus if the external appearance of the pomphi or blebs were to limit the comprehension of the disease. But, then, we would, if adopting this classification, have to include scalds from fluids, as they produce the pomphi in every way resembling pemphigus, in having large blebs of clear, serous fluid under the epidermis, forming bullæ, which burst and leave the epidermis to form a crust. Pemphigus solitarius may very closely resemble this accident of scalds. Urticaria is another affection that may be confounded with pemphigus, or, the more correct term, pompholyx, which is from πομφολυξ = *water*-bubble, while πεμφιξ means *air*-bubbles. The older writers divided the disease easily into benign and malignant, which are yet recognized as separating two large sections of the disease.

The more common divisions are: Pemphigus vulgaris, pemphigus foliaceus, pemphigus febrilis and a-febrilis, pemphigus syphiliticus, pemphigus pruriginosus, pemphigus acutis and chronicus, pemphigus solitarius, pemphigus circinatus and hæmorrhagicus, pemphigus cachecticus, neonatorum, and infantum.

The first question, however, in all these varieties, is to determine whether it is a chronic or acute form we have to deal with. Hebra represented this disease as a cyclical or repeating disorder, which was chronic and incurable, but at the present time we recognize the acute form as having a well-defined course,—a limited duration, and passing off as innocently as a case of eczema. This chronic distinction can be easily determined by observing if the bullæ repeat themselves. Kaposi then traced the history of pemphigus vulgaris. The bullæ formed on an apparently healthy skin without any preceding change in constituents or color, within the short space of two or three hours, ranging in size from a small pea to that of a hazel-nut. After three days the fluid becomes dull and flocculent; the papillæ on which it rests is hyperæmic. After bursting, the site changes from red to dark, till eight or fourteen days has elapsed, when all trace of the changes will have disappeared. The changes will thus be seen to be confined to the papillæ and the rete Malpighii. This does not tell us whether it is innocent or malignant, or whether it will cease or repeat itself. It is only after a

year's duration that this can be decided, when two or three bullæ repeat themselves, and which may be properly designated pemphigus solitarius et diutinus. When these appear on the body, repeating themselves, very little inconvenience is experienced; but when they attack the face, lips, or nose, their discomfort and annoyance is great. But pemphigus vulgaris may also become a very serious disorder, when the bullæ are numerous and bilateral, accompanied with fever and pain, and may continue months, resembling a severe dermatitis in its morbid origin. When this continues for months, and though the patient be young, this vulgaris may assume a very malignant character, which seemed innocent at first. When this form attacks children, it is termed pemphigus vulgaris neonatorum; infants, vulgaris infantum; elderly people, pemphigus vulgaris senilis, etc. From this we may conclude that "vulgaris" gives us no assistance as a term in classification. Where the bullæ succeed one another in a circular form the term circinatus is applied, although this variety may be either benign or malignant, febrile or apyretic, senile or neonatorum, just as in "vulgaris." The differential diagnosis between pemphigus circinatus and herpes iris is not an easy task, but the latter usually commences on the back of the hands and is recurrent. Pemphigus circinatus, as a rule, is malignant, which is easily understood when we consider the morbid anatomy of the disease that the epidermis is repaired from the circumference of the wheal. Stricker has demonstrated that the repair of lost epidermis is accomplished by proliferation and cell-fission in the outer circumference of the lost surface, but if a new wheal or bullæ form near the circumference of this necrosed surface, the repair will be rendered impossible, and thus a malignent form might be reasonably expected.

THE NATURE AND TREATMENT OF FIBROID TUMORS.

At the last meeting of the American Gynæcological Society, Dr. W. G. Wylie, of New York, in a paper on this subject, said that he had observed in tumors which were slow in growth uterine symptoms were equally absent, and that, if pain and general discomfort were present, the endometrium or the tubes and ovaries were usually involved (*New York Medical Journal*, September 28, 1889). In women, 40 years of age and upward, small tumors of the uterus were not usually significant, though they might delay the menopause. If there were pain and failing health about the time of the menopause, it was usually an indication that degeneration was taking place, and hysterectomy would probably be indicated. Fibroid tumors were like all organic matter, and had their periods of growth and decay. He could not speak with accuracy, but believed that the life of a tumor would usually be from two to eight years. Should it cease growing, and after a time begin again, its removal might be required. A tumor might be quite large and give rise to no symptoms; the patient might even be unconscious of its existence. Should complications occur, such as cystic degeneration or suppuration, an indication for removal would then be furnished. If only the lining membrane of the uterus was diseased, curetting might control hemorrhage for a year or more; but, in case it did not, the tubes and ovaries should be removed. If this was done thoroughly, all bleeding would probably cease. He believed that it was possible to do hysterectomy with comparative safety. His own death-rate was now but ten per cent., and he thought it could be lowered. He had experimented with Apostoli's method of treating fibroids for two years, and believed that its value had been overestimated. If it did no harm, it would at least cause delay, and thus might remove a patient's only chance for relief by operation. With women of the child-bearing period strong currents of electricity were inadvisable. Electricity would doubtless stop bleeding from fungous growths of the uterus, but it might also cause damage, and was no safer than the curette. In fact, the use of the latter had been absolutely safe in his experience. His opinion as to the value of electricity was admitted to be provisional, as he considered his experience still insufficient.

Dr. Reamy approved of the conservative tone of both the papers which had been read, especially in view of certain radical views that had recently been enunciated in certain parts of our country. Cases were innumerable in which autopsies revealed the presence of uterine tumors the existence of which had never been suspected during life. Such a fact was fundamental in the consideration of any method of treatment. Martin had recently stated that in two hundred and five cases in which uterine myomata had been removed by him, fatty and other degenerative changes were found in seventy; hence spontaneous cure might occur. It was even possible in cases in which changes of an inflammatory character had taken place, as he

had twice witnessed. The low vascularity of most of these growths also taught us that severe measures were not always necessary. Many might be cured by ergot without the aid of knife or electricity. The speaker was of the opinion that Apostoli had not been fairly dealt with in this discussion. He knew from personal experience that tumors were curable by Apostoli's method. Curetting had not been absolutely safe in his hands, and if, as was asserted, electricity caused stenosis of the uterine canal, it could not destroy the possibility of pregnancy more effectually than removal of the tubes and ovaries, which had been so freely advocated. In his experience oöphorectomy would not always stop the hemorrhage caused by uterine tumors. For the severest cases he conceded the propriety of hysterectomy.

Dr. G. J. Engelmann, of St. Louis, admitted that his results in the treatment of uterine fibroids by electricity had not come up to his expectations. The results were excellent in cases in which the uterus was surrounded by hard masses of exudate. The same was true in the treatment of both profuse and scanty menstruation. In most cases in which the electricity had been used by him, the patients had become more comfortable, and with poor working-women that was of great consequence. No single method of treatment was applicable to all cases of uterine tumor. There was a field for ergot, for the knife, and for electricity.

Dr. J. R. Chadwick, of Boston, was entirely opposed to Apostoli's method. He had followed Apostoli's directions carefully in twenty-four cases, and had seen improvement in but one. In that case the hemorrhage was checked for three years. In none of them had the tumors been reduced in size. In two cases death had resulted, and two others had been nearly fatal. Apostoli alleged much for his method; he was, therefore, a fair object for the most searching criticism.

THE PROGNOSIS OF ALBUMINURIA.

At the recent meeting of the British Medical Association, in the Section of Medicine, Dr. Pavy (*Medical Record*, September 21, 1889), opened the debate on the "Prognosis of Albuminuria with Special Reference to Life Insurance." The author of the paper said that the title of his paper had been chosen for him. The traditional view was that the presence of albumen in the urine was a reason for the instant rejection of candidates for life insurance. In former days, examination of the urine in patients had been less common and routine than it now was. Brinton and Sieveking dilated on the importance of examination of the urine in all cases presenting themselves for insurance policies. It had recently been found that albumen was present in many cases when it was not suspected, and the question had now been put, whether there might not be cases of albuminuria which might not cause the rejection of the applicant for such policies. Albuminuria sometimes occurred as a transient phenomenon. In forced exercise, such transient albuminuria occurred,—for instance, in the case of the great pedestrian, Weston, who passed albumen in his urine after a walk of one hundred and fifty miles, which had greatly exhausted his powers. For a short time his urine was found to contain albumen and casts. Severe mental strain might produce transient albuminuria, as also might cold baths. When not transient, albuminuria might be grouped under three heads,—when there was very little albumen, when a considerable quantity was found, and, lastly, when albuminuria was "cyclic,"—*i.e.*, existing only once in the twenty-four hours. A careful survey of all the collateral circumstances must be made. Bright's disease often was hereditary, or ran in families. Gout and lead-poisoning were likely to lead to some such affection. The other symptoms of the patient should be carefully attended to, such as any unusual pallor, impairment of vision, high arterial tension, want of appetite, or dislike to meat. The specific gravity of the urine would require attention, and a microscopic examination of it would be necessary in difficult cases. When casts in abundance were found in the urine, such cases might be rejected as not fit candidates for insurance; on the other hand, absence of casts was not sufficient to show the patient to be a fit candidate. In some cases, in the male, casts of the seminal tubules and spermatozoa might be seen in the urine, which might be taken for casts of the tubules of the kidney, when no nephritis existed. Such were, in brief, the diagnostic marks of Bright's disease. In the first group, where only traces of albumen were found, it was not clear that kidney-disease existed. Some tests for albumen were liable to objections because fallacious. The granular kidney was accompanied by very slight albuminuria. In the second group, where a certain amount of albumen

existed constantly, it was probable that many such cases got perfectly well, and it was by no means invariable that the existence of nephritis could be detected in such cases, but a decidedly more than ordinary risk existed in these. As to the group of "cyclic" albuminuria, in many such cases there was no albumen found in the urine in the morning, but the amount increased during the day, and, again, there might be none at night. As to admitting such cases as candidates for life policies, there was a certain amount of reserve to be made; although, if they came as ordinary patients to the consultant, a greater degree of optimism as to the prognosis might be indulged in. Perhaps companies might come to admit such cases at a somewhat higher premium. The usual form of albumen met with in ordinary nephritis was serum albumen, but, in "cyclic" albuminuria, organic acids threw down a precipitate of mucin, and some serum albumen was precipitated by other mineral acids.

Dr. Maguire said that there were two groups of cases of albuminuria,—the undoubtedly functional kind, and that not clearly functional. One great diagnostic symptom in this matter was the state of the pulse, and here the finger showed more than the sphygmograph. In cases of hereditary albuminuria there was a pulse of high tension. In cases where there was albuminuria only in the middle of the day and not in the morning, the pulse was that of low arterial tension. Albumen in such cases might be found in considerable quantities when exercise was taken. Hyaline casts were no signs of decided Bright's disease. Dr. Broadbent had shown that there was often low arterial tension in such cases, and the health was not seriously affected. The tension was never so high in similar cases as it was in true Bright's disease; and, three years ago, he had shown that the albumen present in such cases was not that of the organic disease, the presence of globuline alone indicated a less serious form of disease. But the kind of albumen present was not always diagnostic of the nature of the disease. The patients with high tension pulse should not be accepted as candidates for life insurance, whereas in the former group they might, he thought, occasionally be accepted.

Dr. Pye-Smith said that there were cases where acetic acid would cause a precipitate of mucin. The presence of globuline in urine was of less importance, and in such cases there might be no Bright's disease present. But in so far as a man passed albumen in his urine, he could not be considered to be in a healthy, but in a diseased, condition. Even when casts are found in the urine, this was not a certain indication of Bright's disease. In mitral disease, casts might be found in the urine without there being any nephritis present. While Bright's disease might occur without casts, it might also exist with them, and Dr. Mahommed had correctly said that Bright's disease might be present although there was no albumen to be found in the urine. With regard to albuminuria, its presence should be considered, as hæmoptysis, a dangerous symptom. When albumen was found in the urine we were entitled to indulge in hopes that it might not prove of fatal prognosis, but it was advisable to remain in that position and not to be risky in prognosis. In the case of a private patient, he might be encouraged to take a cheerful view; but, as officers of life insurance companies, he held that it was difficult to distinguish between accidental and permanent albuminuria. Lastly, as to the tests, it was surely very important that when persons were comparing different cases of albuminuria, they should agree to use the same test, otherwise much confusion was inevitable.

Professor Gairdner, of Glasgow, said that for many years past he had been studying the question of albuminuria as adviser to life insurance companies, and he was still uncertain as to the existence of anything that could correctly be styled physiological albuminuria. The word functional was not objectionable; but physiological albuminuria was not allowable. When Weston passed albumen in his urine when greatly fatigued, this could not be called a physiological symptom, any more than if, in similar cases, he had had an attack of bleeding from the nostrils. As medical officer to companies, he considered always that the occurrence of albuminuria was a danger signal. As to the practical testing of urine, he considered that the old test—heat and nitric acid—should be stuck to. He had found that among the middle classes who applied for insurance policies, the occurrence of albuminuria was far rarer than recent writings might lead one to expect. Indeed, such a symptom was decidedly uncommon in applicants at his offices. If albumen were found to be present, the medical adviser should ask to have plenty of time to make up his mind; and a good plan in such cases was to ascertain who was the ordinary medical adviser of the patient, and

to communicate with him and ascertain what the history of the case had been, as far as it had come under his notice.

Dr. Rabagliate, of Bradford, said that where there was a mere trace of albumen, the prognosis might be considered to be good in albuminuria, and if the urine was of specific gravity 1.020 or upward; but where it was 1.010, it indicated an advanced state of degeneration of the kidney. The presence or absence of casts was of importance in the prognosis, and the concomitance of gout, eczema, or anorexia, were important guiding-marks. The amount of oxyluria also should be considered in coming to a conclusion. Supposing that a person with albumen in his urine were admitted as candidate for life insurance, what amount of premium should he pay? Dr. Saundby's statistics showed that a very small number of persons died yearly from urinary disease; and he, Dr. Rabagliate, had taken the statistics of the Scottish Widows' Fund, and found that eight per cent. of the deaths in that company were due to such diseases, and half of these were due to Bright's disease. He had also done his best to get the statistics of death from such disease at Bradford, and had found that about 3.4 per cent. of adult males died from Bright's disease in that city.

Dr. Drysdale, of London, said he thought it useless to complicate the question of prognosis in albuminuria with business transactions. It was quite difficult enough without importing that element. The main fact now ascertained was that, whereas, when Dr. Bright wrote his work on "Albuminuria," the prognosis of all cases of albuminuria was for many years looked upon as almost, if not quite, fatal, but it was now known that hosts of cases of albuminuria got quite well, and lived for an indefinite number of years, and apparently without any deterioration of the health. If treated simply and without heroic drug medication, too, even apparently hopeless cases of albuminuria recovered. All this, however, gave but little countenance to the idea that even occasional attacks of albumen in the urine need be considered as of little importance. He could not help regarding the presence of albumen in the urine of any person as a dangerous symptom in all cases, just as attacks of hæmoptysis were always disquieting; and, for his own part, he thought that a person who had habitually or intermittently albuminuria should make his will, if he had any property to leave, and be prepared for any sudden illness, which might, of course, be avoided by careful diet and hygiene. His experience was that heat and nitric acid were the most practical tests for albumen, and he thought it a mistake to import such tests as acetic acid.

Dr. Cranston Charles had found albumen in the urine of thirty-three per cent. of men examined between the ages of 18 and 24; and, in the case of students going up for examinaton, he had found traces of it in twenty-seven per cent. of the cases he had examined. Anxiety might cause the presence of albumen in the urine. In the case of a young lady, a patient of his, albumen was found in the urine; it was found that she laced herself too tightly, and when this was abandoned she lost the albuminuria. Prolonged muscular exercise caused also the presence of albumen in the urine. In some cases he had examined, so long as arterial tension continued high there was no albumen found. Peptones, serum albumen, and globuline might be present in such cases. The tests he made use of were cold nitric acid and picric acid.

Dr. Saundby, of Birmingham, said Dr. Drysdale had remarked that albuminuria was once considered a necessarily fatal symptom, and this was the real cause of the present discussion. The discussion on heart-disease at Brighton had done great service in clearing up the prognosis of that disease, and so would this debate. There were many exceptions to the rule that albumen in the urine was to be looked on as of fatal prognosis. In some cases albuminuria was innocent, and Dr. Pavy's cases of "cyclical" albuminuria were examples of this. There were some cases which might be styled "mechanical" albuminuria. When the patients stood up there was albumen in the urine, which disappeared when they lay down or were sitting. Insurance companies might safely accept such cases; but at present it was necessary to be careful in advising them to do so. Gout, hereditary transmission, frequent recurrent micturition, were evil points in the prognosis of cases of albuminuria. If the urine deposited casts in great quantity this was of bad prognosis. A medical man examining for insurance companies had not time enough for accurate judgment. Dr. Pollock's work, recently published, was too optimistic in its prognosis of albuminuria; and, on the other hand, Professor Frank, of Edinburgh, was too timid in his recommendations. Cases with albuminuria presenting themselves to

insurance companies should be asked to return in six months. Uniformity of tests should be insisted upon. He thought that Dr. Rabagliate's statistics were below the average, and it was known that there were less deaths from Bright's disease in Yorkshire than in other English counties.

Dr. Tyson, of Folkestone, thought the best test for albuminuria was heat and nitric acid. There had recently been great apprehension in the public mind concerning the occurrence of albumen in the urine. There had been, indeed, quite a panic among a certain number of persons where there was no real cause for it. He, himself, had found albumen in his urine for nine months, and had got quite free from it and from all disquieting symptoms. Deaths from Bright's disease were comparatively rare. He was not at all unwell when he had had albuminuria; and he had had several similar cases where his patients had been frightened by being told that they had albuminuria, although otherwise in excellent health. In such cases it was better for the patients to give up all attention to their urine. As to the prognosis in albuminuria, he admitted that it was to the older members of the profession that we must apply for information on such subject, for cases must be watched for many years before the correct import of albuminuria could be judged of.

Dr. Kavanagh remarked that teachers at medical schools might perhaps examine the urine of all their students, and see what became of those who had albuminuria in the course of twenty or thirty years; medical men could be very easily traced in after-life, and thus a prognosis might be arrived at. A remarkable case of recovery from albuminuria existed in the person of a distinguished lawyer in Scotland, aged 80, who, when a youth, had been seen by Dr. Bright, and given to understand that he had a fatal disease, and was not likely to live many months. And yet he got quite well, had a laborious career, and rose to great eminence in his profession.

Dr. Barr, of Liverpool, said he had long thought that in cases of albuminuria the amount of albumen passed was far too much attended to. He was accustomed to pay greater attention to the quantity of urea passed; and, instead of paying attention to the kidneys in such cases, we should direct our attention to the heart and the condition of arterial tension existing. In granular kidney very little albumen was passed; but in such cases it would be found that the patient was passing as much as four hundred grains of urea daily. He had always contended that in albuminuria the heart was most often in fault.

Dr. Hay, of London, said that, with regard to Weston's case of transient albuminuria, the tracings showed that while he was passing albumen he was exhibiting symptoms of high arterial tension.

Dr. Herringham pointed out the frequent relationship of hæmato-globinuria with albuminuria, and cited the case of an elderly gentleman who had exhibited hæmato-globinuria when coming back from a mountain ascent.

Dr. George Harley, of London, said that the result of the two and a half hours' discussion which had taken place was most valuable, and the British Medical Association was useful as a place for mutual instruction, and not for merely mutual admiration. He made it a rule, in the examination of patients, to pay greatest attention to the question of the specific gravity of the urine. It was not the quantity of albumen in the urine that killed; it was the retention in the blood of excrementitious substances which proved fatal in Bright's disease. The moment we had diseased kidneys we may get uræmia, uric acid, and other poisons, all of which tended towards a fatal result. Albuminuria with a urine of 1.015 was curable. Albuminuria of pregnancy and caused by great exertions was a good prognosis. In such cases there was simply congestion of the kidney. He considered that the terms functional and physiological albuminuria were misleading, just as neuralgia was misleading, and of no therapeutic importance. The kidney had no function in eliminating albumen. It was merely a filter. The specific gravity of the urine was the important matter. The presence of albumen, whether temporary or permanent, was not, *per se*, dangerous.

The President read some conclusions which Dr. Johnson, of London, had forwarded to him. These were, that the presence of albumen in the urine is always pathological; the practice of testing the urine in all cases had led to the discovery of many cases of albuminuria that would otherwise have remained undiscovered. To talk of albuminuria as physiological was dangerous; and almost all such cases might be traced back to a pre-existing causation in scarlet fever, cold, etc. On the one hand, intermittent albuminuria was curable. In doubtful cases the urine should be tested several times in the day, in order to arrive

at a conclusion as to the presence or absence of albumen.

Dr. Eddison, of Leeds, was much gratified in hearing the remark of Dr. George Harley, that it was not the passing of albumen that was dangerous. It was to be regretted that the discussion on the prognosis of albuminuria had been mixed up with business transactions. A clever chemist might find out some albumen in the urine, when a physician would not find it, or care to find it. Time was requisite to make up the mind in doubtful cases of albuminuria, and the patient should be asked to return on some future occasion. He would be glad to know more about the production of albuminuria in cases of anxiety, as, for instance, in positions like those he himself was occupying at that moment.

Dr. Pavy, of London, in reply, said that he fully recognized that Weston's albuminuria was a pathological symptom. In great exertion there was, doubtless, incipient disease of the kidneys. These cases were not comparable with cases of "cyclic" albuminuria. The organic acids precipitated one form of albumen. The term physiological albuminuria was not tenable. It would be as sensible to talk of physiological dyspepsia; but the word functional might be allowed. Something in the body was functionally out of order. This need not be in the kidneys alone; it might be in the heart. It was not the loss of albumen that was dangerous in albuminuria, but the retention of the uric acid and excrementitious products.

INTERNAL EMPLOYMENT OF RESORCIN IN WHOOPING-COUGH.

A new method of treatment of whooping-cough, recently recommended by Dr. Concetti, consists in the internal administration of resorcin, since he has found the method recommended by numerous authorities as to the local application of the drug in children prove, in most cases, totally impracticable. He claims that his results have fulfilled his expectations, and, although he does not regard resorcin as an actual specific against whooping-cough, nevertheless, he believes that it is a valuable remedy, preferable to any other in the treatment of this affection. The number of cases in which the author has employed resorcin for whooping-cough amounted to forty-eight, among whom was a nursing infant of only 20 days of age. The daily dose varied according to the age, ordinarily 7½ to 22 grains, dissolved in a considerable quantity of water, being given. The doses were given from one to two hours apart, according to the intensity of the case. In thirty-four cases the affection occurred in its typical form, with repeated spasms of coughing, accompanied by the characteristic whoop. In twelve of these treatment was commenced in the catarrhal stage before the characteristic sound appeared. The whoop subsequently appeared, but only for a few days (from six to fifteen); it was by no means severe, and the attacks occurred but seldom. In the other twenty-two cases, treatment commenced in the second stage, which, in some cases, had already lasted a week or more. In these latter cases the action of resorcin was most evident, since the attacks rapidly diminished both in intensity and frequency, while other methods of treatment which had hitherto been employed in the same cases remained absolutely without effect. The author likewise states that the duration of the disease was positively shortened, some cases lasting but one week, others two, or more seldom, three weeks; in the latter cases leaving a light catarrh, which readily yielded to ordinary remedies. In the other fourteen cases the characteristic whoop was absent, and here also treatment was commenced in the catarrhal stage, and the author believes that the development of whooping-cough was prevented. Among these cases was a woman, and, as is well known, the whoop is frequently absent, even in indisputable cases of whooping-cough in adults. Further, the author claims that in numerous cases he thinks he is able to conclude that of nineteen cases in which the treatment was commenced in the catarrhal stage, that it was aborted in six, and in thirteen rendered mild and of short duration. Dr. Concetti suggests that perhaps the results obtained by Moncorvo and others from the local application of resorcin in whooping-cough was to be attributed to the amount of the drug which had been swallowed.—*Wiener Medizinische Blätter* for September 5, 1889.

ACTION OF BORIC ACID ON THE KIDNEYS.

Dr. Jacob Plaut has made a number of experiments as to the danger of boric acid when employed as an antiseptic, and has published his results in an inaugural thesis presented to the University of Würzburg, 1889.

These experiments appear to show that the results of the constant employment of boric acid, when brought into the peritoneal cavity or under the skin, results in many cases in rapid death if the quantities dissolved are large, or, if small, the final fatal effect is preceded by acute parenchymatous nephritis. The author does not seem to have established that the death of the various animals poisoned by boric acid was attributable to the renal inflammation, but his experiments are sufficient to show that boric acid is by no means the safe antiseptic which it was supposed to be.

ASTRINGENT ACTION OF DRUGS.

According to the Berlin correspondent of the *Medical Press*, September 25, 1889, PROFESSOR ERICH HARNACK, of Halle, in a contribution to the *Berl. Klin. Wochenschrift*, has taken up this subject with a view of throwing some light on the mode of action of so-called astringents. The drugs that are credited with this action are numerous, the most distinguished being the gallic acid group, to which may be added the albuminous earths and numerous heavy metals, especially lead, zinc, copper, silver, and iron. Many acids also in certain concentrations, and some drugs belonging to the aromatic group, are sometimes given as astringents. Spirits of wine and lime-water may also be mentioned. According to the author, the astringing factor is without doubt the formation of an insoluble substance with superficial layers of the tissues that surrounds the cells and presses in between them, which also presses back the fluids of the tissues, and therefore acts as a drying agent, and at the same time prevents the entrance into the tissues of other organisms. It also causes pressure on the tissues, and opposes, therefore, the consequences of the inflammatory process, cell-proliferation, swelling and softening, hyperæmia and hypersecretion. The insoluble substance in question can be best of all formed out of the albumen of the tissues, either by the astringent forming an insoluble combination with the albumen or by a peculiar action, whereby the living albumen is coagulated (as by alcohol, phenol, etc.). In both cases the living albumen, so far as it participates in the process, is killed. All astringents acting in this way are really escharotics; they are not generally so called, for the reason that the layer of living tissue destroyed is too insignificant in thickness to cause any disturbance. The various albuminous combinations with the various metallic salts act variously, and they do not all contribute to the production of an astringent action. In all the astringents that act by coagulating albumen, the astringing action differs from a cauterizing one in degree only, care must, therefore, be taken in the employment of them in delicate mucous membranes and tender parts. According to the author, lime-water is the only astringent that does not act by coagulating albumen, and is not in any way an escharotic; its range of action is limited, however. Its action on mucin renders it of considerable practical value.

POISONING WITH DATURA, AND ITS TREATMENT.

In the *Revue Générale et de Clinique et de Thérapeutique* for September 26, 1889, DR. PEDICINI publishes notes of three cases of poisoning occurring in children of one family from the drinking of a decoction of stramonium leaves. The oldest of these three children was only 3 years of age, and the youngest was a nursing infant. The first signs of poisoning showed themselves in seven or eight minutes. When Dr. Pedicini first saw the cases there was marked dilatation of the pupil and delirium, with coldness of the extremities, delusions, followed by loss of consciousness and stupor. The pulse was slowed, there was suppression of urine, difficulty in swallowing, and during the stage of coma the pupils were contracted. Subcutaneous injections of caffeine in large doses, to prevent collapse of the heart, were administered by Dr. Pedicini, also injections of morphine to suppress cerebral excitation, and injections of black coffee and enemata of water. Recovery took place in all three cases.

TREATMENT OF RETENTION OF URINE FROM PROSTATIC ENLARGEMENT.

At the recent meeting of the British Medical Association, in the Section of Surgery, MR. A. F. MCGILL, of Leeds, opened a discussion on "The Treatment of Retention of Urine from Prostatic Enlargement" (*Medical Record*, September 21, 1889). Mr. McGill remarked that in many of these cases self-catheterization was the only treatment needed; when this failed, or was unavailable, further treatment was necessary. Suprapubic prostatectomy was preferable to a urethral or

perineal operation. The urethral operation was unsatisfactory; it was founded on faulty anatomy, for in only four out of twenty-four cases he had tabulated was there anything resembling a bar at the neck of the bladder. The suprapubic operation was also more generally applicable; in only three of the twenty-four cases in his table could the perineal operation have been done. He considered the suprapubic operation compared favorably with others as regarded safety, but it was not possible to show this from statistics; many of his cases were in old men. In performing the operation he thought the quantity of water injected into the rectal bag should be smaller than that generally recommended; from six to ten ounces was usually sufficient. A catheter should be passed, and left in until the finger entered the bladder. The bladder should be irrigated with an antiseptic solution until the latter came away clear. The prostate should, as far as possible, be removed by enucleation with the fingers (a manœuvre first practised by his colleague, Mr. Atkinson), and not by cutting, though the middle lobe might be cut through at its base after the mucous membrane had been snapped through. Bleeding might be checked by irrigating the bladder with water so hot as to be unpleasantly warm to the hand. Mr. McGill presented a table showing the previous history, condition at time of operation, date and nature of operation, subsequent history, and final result of twenty-four cases, operatively treated by himself, or one of his colleagues, at the Leeds Infirmary, from March 24, 1887, to July 11, 1889. In seven of these there were symptoms of stone, and lithotomy was combined with prostatectomy; calculi were found in all these cases; in one case fifty small ones. Only one of these seven cases died, and he was a man, aged 73, who was admitted for retention, and was in a very bad general condition; at the post-mortem many spots of commencing suppurative nephritis were found in the right kidney. Of the six remaining cases, one was not traced, in one there was no improvement since the operation, one continued well for three months and then another calculus formed in the bladder, and the other three (aged 53, 63, and 70, respectively) were doing well. In the seventeen cases in which suprapubic prostatectomy was performed without lithotomy, there were three deaths,—viz., two within twenty-four hours (one of these from hemorrhage), and one four weeks after the operation. In the latter case the kidneys were found to be granular, and there was a large abscess in the retropubic space. Two other patients also died, but not from the operation, which was successful. One of these died from pneumonia six weeks after the operation; the other became insane and died ten months after operation. In one case, owing to the exceptional hardness of the prostate, only a piece the size of a small pea could be removed, with difficulty. The wound closed a month after operation, but the symptoms were not relieved, so the wound was reopened and a permanent fistula made. The patient (aged 72) was at present confined to bed and wearing a suprapubic urinal of Mr. Buckstone Brown's pattern; but the urine was so very thick that it would hardly pass the pipe. One patient was much relieved, but there remained a very small sinus leading down to the bladder. One patient could not be traced. In the remaining ten the results were good. Seven of these cases were completely successful; in the other three there were occasional bladder troubles. Mr. McGill remarked that fifty-four had been given as the lowest age at which grave enlargement of the prostate was met with, but one of his patients was only fifty-three. This was the first case in his table, and one in which both prostatectomy and lithotomy had been performed; the prostate was the size of a large walnut, and surrounded the urethra like a collar. The credit of inaugurating this operation of prostatectomy was due to Dr. Belfield, of Chicago, who first performed it in 1886.

CHRYSAROBIN IN THE TREATMENT OF HEMORRHOIDS.

Dr. M. S. Kossobudskji has employed chrysarobin in the treatment of twenty-two cases of hemorrhoids, and is well satisfied with the results obtained through the use of this remedy. He does not employ it in as concentrated a form as was first recommended by Unna, who introduced the remedy,—that is five to ten per cent.; but in a weaker solution,—not more than two and a half to three per cent. His method is to first wash off the hemorrhoids with a two per cent. solution of carbolic acid or a one per cent. solution of creolin, and then, after thoroughly drying them with absorbent cotton, to apply two or three times daily a salve composed of chrysarobin, 12 grains; iodoform, 4½ grains; extract of belladonna, 9 grains; vaseline, 3¾ drachms. In the treatment of internal hem-

orrhoids he employed suppositories composed of chrysarobin, 1¼ grains; iodoform, $\frac{1}{10}$ of a grain; extract of belladonna, ¼ of a grain; cacoa-butter, 30 grains; with sufficient glycerin to make suppositories. If there is troublesome bleeding, tannin is employed. The author claims that after employing this treatment for three or four days the most severe cases will be thoroughly cured. The pain and bleeding will disappear and the hemorrhoids will shrivel up.—*Internationale Klinische Rundschau*, September 15, 1889.

TREATMENT OF INDIGESTION FROM GASTRIC ENLARGEMENT.

In the *Medical Press* for September 25, 1889, the Vienna correspondent of that journal publishes an account of PROFESSOR OSER's lectures recently delivered respecting "The Treatment of Indigestion from Gastric Enlargement." Professor Oser maintains that the washing out of the stomach is an important proceeding to commence in the treatment of enlargement of the stomach, but if the disorder depended on a central disturbance of the nervous system, the heart, the kidneys, the liver, or arising from the introduction of a superabundance of fluids and solids, the washing out of the stomach by itself will do very little good. Again, if the cause be due to stenosis of the pylorus, washing, reduction of fluid food, or medicines will profit but little. If the resistance to the passage of food at the pylorus from morbid contraction cannot be relieved by the aid of the surgeon's knife, we know of no medicine that will restore this condition to its normal state. Whether it be the hard cancerous enlargement, or the accumulation of firm fibrous tissue around the pyloric orifice from a long-standing gastritis, we may search in vain for a drug to remove it. If the contraction of the pylorus is only spasmodic, and arising out of an ulcer in the stomach, the resistance will be removed by healing the ulcer. Again, if the cause be due to bolting food, or constantly taking too great a quantity, the stagnant contents can be best treated by removing the *causa nocens*. When the cause is due to muscular weakness of the organ, mechanical treatment of the gastric walls may restore the tonus; but it is evident that if the muscular imbecility be due to the growth of neoplastic tissue all our efforts will be unavailing.

The same reasoning may be applied if the gastric atonicity arises from œdema due to cardiac imperfection, renal disease, or hepatic causes; or the disturbance may be due to anæmia, chlorosis, or paralysis central or peripheral, where the treatment of the primary disturbance will be the principal object. In those cases of stomach enlargement where the dilatations proceed from pyloric stenosis, dyspepsia, or muscular feebleness, the two first indications to fulfil are: raise the tonicity of the gastric muscle, and reduce or change the contents of the stomach. In treating such cases, Professor Oser said his own course was first a perfect supervision of the diet and as little fluid food as possible. There is no doubt that the fluid contents of an indolent stomach lie longer and are more difficult to be absorbed than in a normal organ, as the hard, rough contents of the stomach mechanically stimulate the organ to contract more effectually than fluids. The reduction of fluids is always a very difficult matter to manage in these cases, as the thirst is so intense; but the very least that will satisfy this desire should be allowed, at the same time prohibiting all warm drinks, as tea, coffee, or soups, and when these are taken they should not be administered *along with the meals*, but rather given an hour after the meal. The meals should be very limited in quantity and frequent, about five times in a day, which should consist of lean meat, or all meat of an easily digestible form, green vegetables, white of egg, outside portion of rolls, and a little wine. An organ treated in this way will have no pause for repose, which is sometimes necessary. When this does arise a longer time should be given between each meal. If there be a deficiency of acids for digestion, 8 or 10 drops of muriatic acid should be given three times a day.

INTESTINAL OBSTRUCTION.

DR. GELPKE reports in the *Correspondenzblätter für Schweizer Aerzte* four cases of intestinal obstruction, of which two had been operated on, one with success, and two had been successfully treated with metallic mercury. From these cases he concludes that quicksilver is a valuable remedy in cases of obstruction, and that the metal seems to be quite innocuous to the system if not too long retained. It had been so retained in one of the two cases in which four teaspoonfuls of quicksilver had been given, and the fæces and urine of the patient contained the drug for twelve weeks; there were other distinct symptoms of mercurial poisoning, such as great emaciation, excitement, loss of hair,

and some stomatitis. The other patient, on the contrary, showed no signs of mercurialism whatever. He considers that in hernia it is generally advisable to commence the abdominal section from the orifice of the sac. Finally, considering the uncertain and not very successful results of laparotomy, he would not operate before other means, such as quicksilver, have been tried for from four to six days.

DR. S. V. REITZ, in the *Centralblatt für Chirurgie*, reports the case of a laborer suffering from obstruction of the bowels, who, after three days' fruitless administration of purgatives, was brought to the hospital. Fæcal vomiting was present, and a tumor could be felt on the left side of the umbilicus. Enemata of water by the long tube, though as much as six pounds of water were injected, were unsuccessful, but the vomiting and sickness improved under repeated washing out of the stomach. The next day the patient was considerably worse, and fæcal vomiting returned, with cold perspiration, restlessness, meteorismus, a pulse of 120, and a temperature of 100°. After the enema with the long tube had been again used, and the stomach repeatedly washed out, without any improvement, seven drachms of bicarbonate of sodium in five ounces of water were injected into the rectum, followed by three drachms of tartaric acid in the same amount of water, and the anus closed. The patient, who was on his knees and elbows, complained at once of severe abdominal pains, and in five minutes the injection came away with exceedingly offensive flatus. Shortly afterwards the patient felt considerably better. In three hours the enema was repeated with half the previous doses, and was shortly followed by a large loose motion, and later on by a second. The patient completely recovered.—*Lancet*, September 21, 1889.

Reviews.

IMMUNITY THROUGH LEUCOMAÏNES. By Eusebio Güell Bacigalupi. Translated from the second French edition by R. F. Rafael, M.D.
New York: J. H. Vail & Co., 1889.

The author has endeavored in this little book to carry the investigation into the nature, causation, and prevention of disease a little further than his predecessors, recognizing, as we all must, that in the recent study of microbes and in its extension lies the most promising field for further progress. Somewhere and somehow, involved in this subject, liable at any time to be discovered, equally liable to evade all our efforts, lies the secret hidden, so far as we know, from the earliest day of existence, which, once found, will enable us to realize the wildest dream of the therapeutist. The author seeks to prove two propositions, very closely allied to each other, and he has made use very extensively of recent research and its literature. First, he would establish the fact that the death, or arrest of increase, in a colony of microbes left to themselves, is due to an accumulation of their own products,—*i.e.*, that they are poisoned by their own secretions, that alcoholic fermentation is naturally arrested by an excess of alcohol, etc., thereby establishing his theory of the cause of arrest and so-called "crisis" in self-limited diseases; and, second, he would, if he could, make us believe that subsequent immunity to the same germs comes from the retention in the blood and tissues of the same toxic secretion which originally arrested the disease. Now, while the second proposition seems like a nice one to follow the first, many who may believe the first will not accept the second, for it requires quite an effect to make us, knowing what we do of the rapid elimination of foreign substances from the system, believe that the secretion or excretion of the variolous microbes, for instance, call it ptomaïne or leucomaïne, if you please, the author chooses the latter term for convenience, can remain for fifty years without elimination. What is the nature of such a secretion? As far as we know, judging by the already isolated ptomaïnes, no such substance could find a resting-place, undisturbed for anything approaching such a period of time. And while by no means convinced by the author, we are willing to recognize a value in his work, in that he shows us by this very failure the important nature of the problem. He reiterates, if we are in danger of forgetting it, the momentous question. He shows us how we are driven for an explanation to just such unsatisfactory expedients as his. But while he imagines the riddle already guessed, we see above him, serene and still, the sphynx still waiting. The first proposition which he attempts to prove, introduces us to a very ingenious theory of the cause of the efficacy of vaccination, and an explanation equally ingenious of the reason why vaccinia is able, if performed soon after infection, to anticipate variola. Also he gives us some clue as to why inoculation was more safe than infection

in the ordinary way, all explanations of which previously offered have been weak and unsatisfactory. But let the author, or some one else, actually prove the persistence of leucomaïnes in the blood for indefinite periods, and, above all, prove the return of susceptibility, coincident with their final disappearance, and we will be convinced that he deserves a place with Jenner and Pasteur, and with regard to Pasteur the author seems to have made a close study of his methods, and, viewed in the light of his theory, the mystery attending hydrophobic prophylaxis seems dissipated; in short, we recommend a careful study of this work to every earnest student of disease, for if the vital idea we seek be not in it, it may still be some day elicited by the very line of thought which the author has pursued. E. W. W.

MOTHER, NURSE, AND INFANT; A MANUAL ESPECIALLY ADAPTED FOR THE GUIDANCE OF MOTHERS AND MONTHLY NURSES, COMPRISING FULL INSTRUCTION IN REGARD TO PREGNANCY, PREPARATION FOR CHILDBIRTH, AND THE CARE OF MOTHER AND CHILD, AND DESIGNED TO IMPART SO MUCH KNOWLEDGE OF ANATOMY, PHYSIOLOGY, MIDWIFERY, AND THE PROPER USE OF MEDICINES, AS WILL SERVE INTELLIGENTLY TO DIRECT THE WIFE, MOTHER, AND NURSE IN ALL EMERGENCIES. By S. P. Sackett, M.D.

New York: H. Campbell & Co., 1889.

Dr. Sackett thinks that the mother, nurse, and infant need just such a book as this,—viz., a book which will make them too wise to be mothers and nurses, and not quite wise enough to be doctors of medicine, but almost as wise as some. Dr. Sackett's opinion about mothers and nurses seems also to be the opinion of most medical men who write books for mothers and nurses. They insist in telling the aforesaid mothers and nurses so many things that they do not need to know, solely because they feel it necessary that the mothers and nurses should be made aware of the fact that the author knows them. They are supposed by the readers to be but tiny draughts in the great storehouse of knowledge which their medical author possesses, but they really cover his whole field, tell all he knows, and much that he has to find out in books, so that mother and nurse will not perceive his ignorance. But for what infants was this book written? At what period of infancy does the author expect his infants to begin study? Perhaps, if read by the mother in her pregnancy, the child may receive the maternal impression, and be marked—heaven save the mark!—by Dr. Sackett's book. Such an infant, if thoroughly marked, would know pretty much all obstetrics, be capable of diagnosing its own position and presentation, watch with scientific interest from above the dilatation of the os uteri, feel a passing fear at the too early rupture of the membranes, know how to dodge around pelvic tumors, and in desperate emergency deliver itself instrumentally. Craniotomy would for such an infant, perhaps, be impossible, but it could direct the proper management of the funis, and prescribe quite extensively, from the formulæ given, for its colic and other ailings, and even for its mother should she suffer from mammary abscess or puerperal septicæmia. In short, such infants, imbued in intra-uterine life through maternal impression with sound medical principles, might be expected, with reasonable certainty, to make some stir at an early period in medical circles. Who has not noticed the growing power and audacity of youth in medicine? Experience seems now unnecessary; years of preparation are no longer needed. Do not these facts point to an imperfect intra-uterine medical education, soon to be perfected under the happy influence of Dr. Sackett's book? Evolution, in its truest sense, rather supports Dr. Sackett's idea; and we shall look with interest to the future of infants educated upon this plan, for while we as a body are notoriously unable to cope with many of the problems daily presented for our solution, everything may be expected in the next generation from Dr. Sackett's novel idea. E. W. W.

A TREATISE ON GOUT. By Sir Dyce Duckworth, M.D., Edin. M. D. (Hon. Causa), Royal University of Ireland. Fellow and Treasurer of the Royal College of Physicians of London; Hon. Fellow of the King's and Queen's College of Physicians in Ireland; Physician to and Lecturer on Clinical Medicine in St. Bartholomew's Hospital.

Philadelphia: Blakiston, Son & Co., 1012 Walnut Street.

We have examined, with a good deal of care and a large amount of pleasure, this handsome volume of nearly five hundred pages, and find that it is a very well written, clear, and thoroughly satisfactory epitome of our present knowledge upon the subject of gout, evidently based upon a large experience both in the sick-room and in the dead-house, and upon a thorough knowledge of English and continental literature, with a complete ignorance of American work.

We read on page 340 that in the United States of America gout is practically unknown, a statement made, it must be re-

membered, with a knowledge of Hirsche's affirmation that "gout would appear to be as common in the large and populous cities of the New World as it is under the same circumstances in those of the Old."

Our own experience is, of course, with the city of Philadelphia, and we would say that two-thirds of the people beyond middle age who represent the older families of the city are distinctly gouty,—certainly the gouty diathesis runs everywhere, permeates almost every family, and crops up everywhere in chronic diseases.

It so happened that the writer of this article was sitting on a sofa groaning with gouty pains, while his wife was coming up-stairs complaining that her knees were so stiff she could hardly walk; and then to be informed that no gout existed in the United States was certainly very comforting.

The gout in the United States is a different disease in its manifestations from the gout of England; but the diathesis is as abundant here as there. True, podalgia, or frank gout in the toes, is yet with us such a very rare affection that it exists only in a small percentage of the cases.

We further read in Dr. Duckworth's book that "the ancestry, diet, and habits of the citizens of the United States, for the most part, are such as will long prevent the onset of gout in that country. The immigration of Irish, Scottish, Scandinavian, and German people into that country peoples it mainly with a stock void of gouty heritage. The good climate and the active open-air lives of the people will tend to avert goutiness. But little wine is used, the beer is light, and much water and weak tea are taken. The alchohol chiefly used, or abused, is rye-whiskey." Which is amusing. Would it be presuming if we were humbly to suggest to our author that he ought to inform himself upon the subject by at least reading such well-known text-books as George B. Wood's "Practice of Medicine," and that a chapter upon gout in America written by an American clinician would be a valuable addition to the next edition of his work.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS. Vol. iv., No. 1, October, 1889.

This number of the series of so-called "Monographs" contains two unimportant papers, which together occupy thirty-two of the three hundred and twenty-two pages which make up the volume. The one on "The Influence of the Male Element upon the Female Organism" was read by John Brown, M.D., before the Glasgow Southern Medical Society, and is, in the main, a *résumé* of well-known theories upon the methods of inheritance and the causes of variation therein. It is without obvious practical application. The one on "The Internal and External Temperature of the Human Body as modified by Muscle-Kneading" was read by A. Symons Eccles, M.B., in the Section of Anatomy and Physiology at the meeting of the British Medical Association held in August, 1888. It records some sphygmographic and thermometric experiments, which seem to demonstrate that muscle-kneading increases the force of the heart's action and the quantity of blood passing through the muscles and skin, conditions usually thought to be sufficiently apparent after this form of massage not to need experimental proof. The absence of control experiments vitiates the further conclusions drawn as to the effect upon the circulation in the brain.

The remainder of the volume is taken up with Mr. Thomas Bryant's treatise on "The Diseases of the Breast," which does not require special notice.

The subscriber to this series will, doubtless, be glad to add this work to his library, although, if he seeks the latest information on the subject, especially as regards either pathology or operative methods, he would scarcely at the present day select Mr. Bryant's book. It is difficult to understand, however, except as a mere specimen of book-making by the process known as "padding," why the two former essays should have been included. The absence of an index lessens materially the already very slight practical value of the volume.—J. W. W.

Correspondence.

BERLIN.

(From our Special Correspondent.)

Somnal, the Latest Hypnotic — Monstrosities — The Mother-of-Pearl Affection—Tuberculosis of the Iris—Tuberculosis in Fowl—The Latest Researches of the State Board of Health—Erotic Abnormities—Medical News.

Eureka! The long and anxiously hunted for ideal hypnotic, pure, prompt, and harmless, has at last been discovered. If you doubt it, read the eulogy on somnal just published by its discover, Dr. Radlauer, proprietor of the well-known Kronen-Apotheke of

Berlin. After perusing it, you will readily admit that there is no longer room for scepticism regarding this vital discovery, and that henceforth insomnia, thanks to the genius of the German chemist, will be a thing of the past. Fortunately, however, the American practitioner has too much common sense, and, besides, has been duped too often, to put much faith into the alleged virtues of the new remedies with which the German chemists have of late flooded the market. Have, for instance,—to confine ourselves to hypnotics,—not the same claims been advanced in regard to paraldehyde, urethan, methylal, hypnone, hydrate of amyl, and, quite recently, sulphonal and chloralamide? Still, as conscientious physicians, we deem it proper to familiarize ourselves with all therapeutical innovations, and, if occasion should offer, to give them a trial. Somnal, the new hypnotic, is virtually an ethylized chloralurethan, and is chemically represented by the formula $C_7H_{12}Cl_3O_3N$. It is prepared from alcohol, urethan, and hydrate of chloral, and is a clear, colorless liquid, of a somewhat bitter taste, and is easily soluble in both alcohol and ether. It differs from chloralurethan in containing two additional atoms of carbon and four of hydrogen; it melts at 42° C., and fuses at 14.5° C. in a vacuum. The new drug is not affected by $AgNO_3$, nor by acids. As dose of somnal, 2 grammes (30 drops) are stated, best given in combination with either succus liquiritiæ or syr. rub. idæi, as in the following formula:

℞ Somnal, ʒiiss;
Aquæ dest., ʒii;
Sol. succi liquir., ʒv. M.
Sig.—A tablespoonful at night.

Dr. Radlauer claims that half an hour after taking the drug sleep ensues, which lasts from six to eight hours, and is so quiet and deep as to closely resemble the physiological state.

The testimony of Dr. Paul Guttmann, the widely-known Berlin therapeutist and chief of the Moabit (Berlin) City Hospital, is somewhat less sanguine than that of Dr. Radlauer. "Somnal," Guttmann says, "is a good hypnotic, and has the desired effect *in most cases*." Radlauer emphasizes, besides the innocuous character of the new hypnotic, though regarding this important point, clinical testimony is as yet lacking. One great advantage, however, the new remedy possesses with certainty,—viz., its cheapness,—ten grammes (ʒiiss) costing but fifty pfennige (twelve cents), and one hundred grammes one dollar.

Somnal, as I have learned, is being at present tried by Professor Senator and in the Royal Charité; but regarding the result of these trials, nothing definite is as yet known.

If you are a hunter or a lover of so-called rare or unique medical cases come to Berlin and gratify your taste. There is not a week passing but the Charité furnishes a puzzling or unprecedented case. Professor Olshausen, chief of the gynæcological clinic, demonstrated this morning a living child, born at the institution the day before yesterday, which is one of the greatest monstrosities ever born. The infant, a boy, presented a perfect and most extraordinary form of ichthyosis. The *entire skin of the infant consisted of scales*, and presented in every locality, even on the head, broad red stripes, which are the result of cutaneous cracks, giving the little one the appearance of a zebra striped red and white. Passing my hand over the skin of the child, I heard a distinct noise, and scratching the cutis with my finger-nail, the former peeled off like the scales of a fish. Another interesting feature in the boy is the total absence of eyes; eyelids and eyelashes, however, being present. It is not likely, as Professor Olshausen thinks, that the child, owing to the nature and extent of its abnormities, will live very long. The mother of the child had previously given birth to two similar monstrosities, one of which is being preserved at the clinic in alcohol, while of the other an accurate drawing can be seen. Several other children were born normal and are alive. The etiological factors of the affection are wholly unknown, although the hereditary element has frequently been distinctly traced. Olshausen, in the course of his pertinent remarks, alluded to a Viennese lady whose five sons were all affected with ichthyosis, while her three daughters were normally constituted. Occasionally the hereditary disposition reappears in the third, instead of in the second, generation, or in a collateral branch of the family. Quite notorious in this direction was the Lambert family (father and two sons) in the last century, which, as "the porcupine-men," exhibited themselves in public shows, and have been described and depicted by two physicians.*

* By a singular coincidence Professor Olshausen was enabled to show the class another and still rarer monstrosity,—viz., thoracopages,—that is, twins connected

Dr. Levy presented at the last meeting of the Berliner Medizinische Gesellschaft three cases of the so-called mother-of-pearl affection. This disorder, which occurs exclusively in workmen engaged in the cutting of mother-of-pearl, is a rare one, and has hitherto been only observed in Berlin and Vienna. The specific symptoms of the affection are violent pains in the bones, swelling of various or all osseous structures of the body, insomnia, and moderate fever. The swelling begins invariably on the epiphyses of the bones, and may persist for years. Suppuration is exceptional, and restitutio ad integrum the rule, although relapses are very frequent. Thus far twenty-five cases in all have been described. All three patients presented by Dr. Levy were young men. The first one presented a considerable swelling of the lower jaw, extending to the masseter muscle. The second patient showed swellings on both jaws and on the left clavicle. He had four relapses, and complained continually of toothache and a sensation of looseness of the teeth. The last patient presented marked swellings on the right shoulder-blade in the region of the fossa supraspinata, on the right clavicle, all metatarsal bones, and on the right femur, which was nearly three times the normal size. The etiological relations of the affection, Dr. Levy said, were not yet wholly cleared up. Englisch and Gussenbauer regard the symptoms as due to embolisms in the arteries of the bone, caused by carbonate of lime, which makes up ninety-five per cent. of the Aricata margaritofera,—mother of pearl. Another interesting feature of the same meeting was the presentation of a specimen of tuberculosis of the iris by Professor Hirschberg. The specimen was taken from a child 18 months of age, which was admitted to the clinic in May, presenting a large tubercular node in the upper portion of the iris. The excision of the tubercular focus in the iris was not deemed feasible. In June a cheesy degeneration of the tubercle took place, and tubercular swellings of the size of a pea appeared on the margin of the cornea. This state of affairs being of course very painful, and tending at the same time to a general infection of the eyeball, this structure was removed by Professor Hirschberg. The child recovered, and did not show any tubercular signs in any other portions of the body.

Speaking of tuberculosis, I am reminded of a case of genuine tuberculosis recently observed here by Dr. Danziger in a Plymouth Rock cock. This is supposed to be the first instance that this affection has ever been noted in fowls. The usually spirited animal mentioned had to be killed, as it refused to eat, and by its general behavior showed the evidences of sickness. The large size of the liver attracted first attention, and, on examination, that organ showed twenty large tubercles. The mesentery was literally covered with tubercles, all following the course of the lymphatic vessels. Tubercular nodes having been likewise found in the spleen, the kidneys, the larynx, and trachea, there is, of course, not the slightest doubt as to the nature of the rooster's affection. It must be admitted that an occasional infection of man from tubercular fowls is not impossible. Possibly the German government, which allows no meat to be offered for sale unless it has passed an official inspection, will in future extend its ever watchful care also to the dead fowls of the market.

The great centre of the official sanitary inspection system of the German empire is "Das Reichs-Gesundheitsamt"* and "Das Hygienische Institut," both presided over by the illustrious Koch. There is really no more unpretending physician or teacher in the whole Fatherland than Professor Koch, although his name is a household word all over the world, and the government has showered money, titles, and honors on him. A week or two ago I saw him enter a third-class car on the elevated railroad, while possibly none of his students would regard it consistent with the dignity of a "Musensohn"† to travel in any but the second class. Koch's charming simplicity is a refreshing contrast to the usually exhibited presumption of German celebrities, and reminds one of a distinguished American anatomist, who, inquiring once for the cause of the student's applause as he entered the lecture-room, learned that a tribute was paid to his new suit.

Recent investigations made by Dr. Jaeger at the Hygienic Office regarding the relative efficiency of various antiseptic agents on brief exposure are sufficiently interesting to

by their thorax. The babes, who had died during delivery, were quite normally and even well developed, differing in this respect from most other monstrosities of this kind, which usually present a deficient development. The union of the twins includes thorax, sternum, and the ribs. Like in the "Siamese twins," the couple were of the same sex, and resembled each other strongly.

* Imperial sanitary office.

† Son of the Muses, as the German students call themselves.

claim our attention. Among the drugs, the action of which was tried on pathogenic and non-pathogenic microbes, were chloride of lime, tar, carbolic acid, creolin, potassium and sodium lye, permanganate of potassium, sulphate of iron, corrosive sublimate, chlorine-water, and aseptol. The greatest efficacy on pathogenic bacilli* was exhibited by chloride of lime; next in order came coal- and wood-tar, and a five per cent. solution of sodium lye. Permanganate of potassium and sulphate of iron proved almost inert. Against the anthrax germs carbolic acid proved most effective, and against the tubercle bacilli first sulphurous acid, then carbolic acid, creolin, cresolin, and wood-tar.

Of a similar character are also the recent researches carried on in the same institution by Dr. Heim, under the direction of Professor Koch. The special object of Heim's observations was to determine the vitality of the bacilli of cholera, typhoid fever, and tuberculosis in milk, butter, whey, and cheese. The bacilli of cholera retain, as Heim found, their vitality in cheese for six days, and survive eventually even the process of curdling of the milk, while in cheese they live but a single day, and with the exception of those of tuberculosis and anthrax.

The bacilli of typhoid fever survive in milk twenty-one to thirty-five days, in butter fourteen to twenty-one, and in cheese but three days. The tubercle bacilli were found to live in milk ten to twenty-eight days, in butter twenty-eight, and in cheese nineteen days. One of the most interesting papers ever published in Berlin is one entitled "Male Impotency and its Treatment," the last series of which has appeared this week. The author of this treatise, which, on behalf of its spicy but also therapeutically instructive features, has elicited very favorable comments, is a well-known Berlin specialist. Let me abstract from his chapter of "Erotic Perversions" two interesting cases. The first is a student of law seeking medical advice for pollutions and impotency. Patient admits having been guilty of onanism ever since childhood; he has had an apoplectic stroke, and still presents a paresis of the facial muscles. He complained of weakness of memory† and utter indifference towards the fair sex. His only voluptuous indulgence consists in throwing a ligature around his arm, and causing the veins to swell by checking their return flow. This manipulation gratifies even his intensest amorous appetite, causing erection and ejaculation. By powerful self-control he has succeeded in gradually checking this singular sexual aberration, but at times is still compelled to resume it.

Another erotic abnormity, recorded by Casper, has first been described by Hammond, and occurred in a young man 24 years of age. This patient could never feel any erotic emotions unless he either saw, or, at least, thought of, a woman's shoe. When quite a young boy and attending school he noted one day accidentally the foot of his lady teacher peeping from underneath her dresses. A powerful impulse forced him to suddenly approach the teacher and seize her shoe. Although punished for what was at first regarded as sheer rascality, he persisted in his strange behavior until he had to be taken from school. Later in life his erotic thoughts and doings all centred in the woman's shoe. He secretly procured this article at night from the servant-girl, his sisters, and even from their accidentally visiting friends in order to utilize it as a means of masturbation. Still later he bought girl's shoes until he had a sufficiently large collection of this article to open a shoe-store. Finally, after having sought medical advice, he gave up the shoe-store and got married, but soon discovered his total impotency. Advised to hang up over the bed a woman's shoe, and to centre his thoughts on this article before cohabitation, the patient really succeeded, in course of time, to gradually shake off his singular aberration and to assume normal marital relations.

In conclusion of my letter, a few items of general interest.

The Berlin president of police issued a few days an official warning against the use of American evaporated apples, which, as chemical analysis has proven, contain salts of zinc. This warning having been published in all German papers, it cannot fail to react on the American wholesale dealers of this article, who have thus far supplied the German market.

Göttingen, the famous German university, last week celebrated the inauguration of a new surgical clinic, which is probably the finest institution of the kind in the German empire. Professor König, the well-known surgeon of Göttingen, through the interven-

* With the exception of those of tuberculosis and anthrax.

† Disinclination for work.

tion of Von Gossler, Prussian secretary of cult, obtained the necessary funds from the state. Gossler is the great friend and protector of the German medical schools. He is perpetually pleading for their enlargement, and the recent establishment of departments of hygiene in various German universities, notably Berlin, Marburg, and Giessen, is his special merit.

That the remuneration which the German government has thus far bestowed upon its medical officers is but a meagre one is revealed by the recent proposal to raise the salary of the general *Stabsarzt* der armee. The salary of this gentleman—the highest medical officer of the army—amounted to but two thousand three hundred dollars. In view of his exalted office, the unavoidable obligation of representation, and the preclusion of private practice, it is to be hoped that the proposed advance in his salary will be granted.

LONDON.

(From our Special Correspondent.)

Every now and then the idea that patients are experimented upon in hospitals finds public expression. It is not only the ignorant public who believe this, but a fair proportion of educated people have the same notion. These people actually ought to know better: to them it is of little use telling of scientific investigation in relation to disease. They take advantage of the acknowledged vagueness of knowledge in some departments of medicine, and express loudly their opinion that what was good enough for their forefathers is good enough for their sons. It is fortunate, perhaps, for such people that they have these opinions, as it makes them contented with their existence. In spite of them, however, scientific medicine progresses, although slowly. These remarks are called forth by the charge made by the secretary of one of the special London hospitals against the medical staff of using the patients for purposes of experimentation, one of the cases being an abdominal aneurism, in which wire was coiled with the view of cure.

It is, perhaps, worth while to consider sometimes what is really meant by an "experiment." It really means something performed with the view of discovery, the results of the performance being unknown, or only guessed at. Taken in this sense, there is no doubt that some part of our treatment of disease is experimenting. In many cases of obscure disease, for example, we have to try drug after drug in order to see whether any amelioration is produced: our knowledge being imperfect both as to the action of the diseased condition and as to the action of the drug that we cannot accurately foretell that any good will come of our treatment. In many of these cases, however, we are guided by previous experience, which has taught us that in other cases of the particular disease a certain drug has been beneficial, or that it has done good in allied condition, or, lastly, from theoretical considerations, we may expect that the human physiological action peculiar to the drug may be beneficial in the pathological condition observed. In still other cases a remedy given for a certain symptom may relieve another symptom, and thus find an extensive sphere of usefulness. To go back to early times for illustrations, it must be admitted that the discovery of the usefulness of herbs was accidental, and that their first administration in disease must have been more of an experiment than any that we perform now. The reputation of herbs cropped up no one knew how: it was part of folk-lore. Paracelsus, the great authorized quack of the Middle Ages, undoubtedly learned a great deal that was useful in the treatment of disease from herbalists and their like. We do not wish to speak against any such additions to our knowledge, for have we not thereby gained cinchona, digitalis, and erythroxylon coca; but we wish to point out to those who speak glibly of modern experimentation on patients that these early experiments were decidedly shots in the dark, and often, no doubt, left their mark in their track.

To come down to our own times, there are many instances that may be cited of the usefulness of a drug discovered in the ways already pointed out. Take strophanthus as an example: its utility was indicated by the observation of its action on the frog's heart; but its first administration in cardiac disease was undoubtedly of the nature of an experiment. It was not to be foreseen, for example, whether it would have any prejudicial action besides its beneficial one in regulating and strengthening the heart. According to certain lay ideas, however, it would not be justifiable to try strophanthus, because we did not know all these things beforehand. Certain of these expressed lay ideas are really very like that of the well-known Irishman, who, narrowly escaping drowning, declared he would never again enter the water until he had learned to swim. We cannot al-

together afford to despise lay opinions on medical subjects. In the British isles, at any rate, it is the lay element who are really responsible for the financial management of the hospitals; and, owing to the wide distribution of popular works and pamphlets on medical subjects, the lay mind has, in certain quarters, commenced to think it is competent to judge of all medical matters. It is, however, not so; and how difficult it is to judge of these matters only the trained medical practitioner knows. Part of the distorted ideas which are prevalent among the lay public no doubt arise from this ignorance. The majority of our patients, rich or poor, wish to be relieved of their obvious symptoms; and, as a rule, if they do not feel anything or see anything the matter with them they cannot believe that they are ill; and, moreover, if a remedy does not produce an effect obvious to them, or if several remedies are tried for their relief without result, they are apt to get distorted ideas as to the treatment employed. One of these ideas is that they are being experimented upon; and some even go so far as to assert that the doctors look upon their hospital patients simply as objects of experimentation. How false this notion is, is, of course, evident to any one attached to a hospital, and, as Sir J. Risdon Bennett lately said in a lecture delivered at the Victoria Park Chest Hospital, there is no more experimentation on patients carried on in hospitals than in private practice, in which latter case, as a rule, patients have something, often a good deal, to say about their own treatment. It is not to be denied, indeed, that there are many medical men who turn their faces away from anything newly introduced; but they are getting fewer and fewer, as they cannot afford to lose the advantage of the really good and honest work now being done in pharmacology and therapeutics in different parts of the civilized world. There are some people, again, who, to express it somewhat coarsely, would rather be killed by the old drugs than saved by the new. Such people are, of course, as all patients must be, in the hands of the medical practitioner, and it is to him that medical art must look for disabusing them of distorted ideas. There must always be a certain amount of experimentation in medical practice, or else the science and art of medicine would never progress; but a mode of experimentation to be controlled by a judicious hand, and not simply a wild groping in the dark. Utilized with not too much timidity or too much rashness, such "experiments" have been the means by which medicine has arrived at its present condition of hope.

PARIS.

(From our Special Correspondent.)

A Vaccination Scare in French Flanders—Surgical Instruments should be sterilized—Jeye's Creoline analyzed—Milk-Sugar a Doubtful Diuretic—Ouabaine and Strophanthine as Local Anæsthetics—Exposition Nosology.

Several recent vaccinating accidents having made people very nervous about the use of humanized virus, the Motte-au-bois occurrences of last summer deeply exercised the neighboring population, and it is only within a week that all fears have been allayed and the excitement ended. The facts are as follows: On July 31, Dr. Decouvelaere, of Hazebrouck, a government dispensary physician, having gratuitously vaccinated forty-three children at Motte-au-bois, a village a few leagues from Lille, all the young patients were soon after affected with very suspicious-looking sores, eruptions, and other symptoms. Much puzzled, and rather frightened at what he considered epidemic syphilis, on August 19 he called on Professor Leloir, of the Lille Faculty, to examine the sick children. The professor found all the patients to be over 5 or 6 years of age, and to have been all vaccinated with the same virus taken from Z., a stout boy, 9 years old, and outwardly healthy. While in appearance the ulcerations, adenopathous symptoms, eruptions, and other lesions seemed to be of syphilitic nature, yet some doubts remained in Dr. Leloir's mind, and he refrained from giving an opinion until further developments took place. In the mean time the Paris Academy of Medicine, having been informed of the occurrence, on August 25 sent Dr. Hervieux to investigate the matter and report. Outside of the symptoms at length described in the reports, a suspicious circumstance was that, while the boy Z. showed no trace of syphilis, both his father and mother obstinately refused to be examined. As the man was an old soldier, such declining might be taken for a sort of moral proof of guilt by any one not familiar with the Fleming's strict idea of modesty. But positive proof there was none. In favor of the syphilitic hypothesis, Dr. Hervieux placed the induration surrounding the ulcers, the adenopathies observed under the arm-pits, and the unlikelihood of ulcerous vaccination in strong, healthy subjects living in a salubrious neighborhood. On the other hand, there was against syphilis a single argument,

but a capital one,—namely, the short period of incubation. As all the accidents occurred within twelve days after inoculation, and vaccinal syphilis will never show its hand before the fifteenth or twentieth day, and often later, the syphilitic hypothesis, he thought, should be set aside. At the same time the Parisian doctor, like his Lille brother, who rather inclined in favor of syphilis, would not commit himself until the period of secondary accidents had arrived. This was about the middle of September. It is unnecessary to say the parents of the forty-three children remained in the deepest anxiety, and greatly incensed against all doctors, the more so that at election time politics got mixed up in the affair, and rival candidates worked the occurrence "for all it was worth" for and against the administration. And now, at last, near the middle of November, no secondary accidents having occurred, the faculty has officially proclaimed the cases were not syphilitic. The Motte-au-bois people, although easier in mind, are more angry than ever against vaccine, academies, and everything that looks like a physician. The old soldier, Z., threatens to shoot any doctor who darkens his door. Animal vaccine partisans argue that since humanized virus will, besides syphilis, convey other diseases for which fault is found with animal virus, it should be discarded altogether. As to anti-vaccinationists, they are exultant, and proclaim more loudly than ever that vaccination is worse than small-pox.

The wise old saw, that Cleanliness is next to godliness, was the other day forcibly illustrated at the Academy of Medicine. Only modern ideas of cleanliness have been rendered vastly more exacting by the discovery of bacteria and like microscopic germs of disease. Surgeons' instruments and barbers' tools must be not only apparently, but effectually and "microbically" clean. Dr. Hervieux having related a series of suspicious accidents caused by imprudent vaccinations with humanized virus, Dr. Lancereaux enforced the warning by adding some facts from his own experience. One case was that of a robust man, 53 years old, who, with his wife, came to consult him for a papulo-pustular eruption, presenting all the characters of acneiform syphilis. The woman was perfectly sound. The man had no trace of syphilitic accident either on the genitals or in the inguinal ganglions; but back of the neck a small, painless, indurated ganglion existed, and under the maxilla a larger tumefaction, the size of a chestnut, surrounded with several enlarged ganglions. As the lips and mouth were without blemish, and the patient was, about three months before, submitted to catheterism of the Eustachian tube for deafness, the operation most likely brought on the infection. The fact that the accidents occurred on the side treated, and their regular, almost classical evolution narrated by the patient, left no doubt that the ear doctor's catheter gave him the syphilis. Another instance was that of a woman, æt. 36, who, twenty-five or thirty days after having a slight dental operation performed, noticed an indurated ulceration appearing on the gum. Some six weeks later a diffuse eruption broke out, and was followed with indolent ganglionar swelling, painful periostitis, etc. All these symptoms, together with the success of a mercurial treatment, made it certain a syphilitic affection had been communicated by the dentist's instruments. A like danger is to be feared from the barber's tools, passing, as they do, from one person to another, and many are the cases recorded of syphilis communicated by tonsorial razors, combs, and brushes. The absolute necessity should be impressed upon all—surgeons, midwives, dentists, and barbers—to always keep all their instruments scrupulously clean and disinfected. Upon which Dr. Magitot remarked he perfectly agreed with his fellow-academician, as, besides syphilis, other contagious diseases are liable to be disseminated by all instruments employed on many persons in succession. The objects should every time be not only cleaned but sterilized. Sublimate solutions are probably the best antiseptics we have. But as poisons cannot be intrusted to every one, non-doctors should be recommended to either pass their tools through a flame or dip them in boiling water. It may be added that the Council of Hygiene (board of health) has issued instructions to barbers, warning them of the penal responsibility they incur when propagating contagious diseases, and advising them to prevail upon their regular customers, so that each may have a separate brush and comb. As to the common tools, the steel implements should be washed with either boiling water or a five per cent. solution of carbolic acid, and the combs and brushes cleaned with soap and water, and dried in bran.

Jeye's creoline has of late been extensively advertised in France by means of flaming posters and other eye-catching devices. The result has been to increase the sales, no doubt, but also to call the attention of native chemists and pharmacists, always jealous of new preparations encroaching on their domain. And it is but natural for a qualified druggist to dis-

like retailing at a small profit strange compounds which he might as well prepare himself. For some time Jeye's creoline baffled investigators, but recently at Nancy—likely at one of the college of pharmacy laboratories—they found it to consist of impure carbolic acid, mixed with a resin soap to make it miscible with water. Proximate chemical analysis prove it to be composed as follows:

Hydrocarbons boiling between 200° and 350° C.	59.6
Impure phenols (200° to 310°)	10.4
Pyridic bases	0.8
Abietic acid	23.0
Soda	2.8
Water	3.4
	100.00

To translate the technical into usual terms, creoline was found to consist of about seventy per cent. impure carbolic acid with thirty per cent. resin soda soap.

Some time last June Dr. Germain Sée read before the Academy of Medicine a lengthy communication, in which he greatly extolled *milk-sugar* as a diuretic. To support his views he presented an array of cases showing lactose to produce copious diuresis without any increase of arterial pressure. With it he had caused in patients such a flow of urine unequalled even by strophanthus. The idea of substituting, for all sorts of drugs more or less poisonous, plain cow's milk or a solution of milk-sugar, was of course really fascinating. Unfortunately, in practice the treatment has not proved very successful. First, it was demonstrated by Dr. Dastre that all sugars are more or less diuretic, a fact long since familiar to physiologists, and that lactose not being assimilable as such but only when transformed into glucose in the economy, it is preferable to administer at once glucose itself. And now, at the Therapeutic Society meeting of November 13, even the wonderful diuretic properties were contested and brought down to a very moderate level, probably the true one. Dr. Cadet de Gassicourt said that for six or seven days he gave to a child 5 ounces of glucose every twenty-four hours, and noticed that the quantity of urine passed was quite large when much water had been administered, but very slight with the glucose dissolved in but little liquid. Hence he concluded water was the main therapeutic agent in the medicine. Dr. Bucquoy having given it as his opinion that to have its full effect lactose must be associated with about four pints of water, and then it is rather more diuretic than plain water, Dr. Huchard remarked he had given lactose many trials, and found his experiments as unsatisfactory as those just related. Consequently he inclined to think Dr. Germain Sée was under a therapeutic delusion, and lactose only acts through the water holding it in solution, an opinion concurred in by Dr. Rougon, who conducted his experiments with chemically pure lactose.

Ouabaïne, the new crystalline principle discovered by Dr. Arnaud in an African heart-poison, and studied by Dr. Gley, has been by the latter found to possess remarkable local anæsthetic properties on the cornea. When a few drops of a solution—1 to 1000 of distilled water—are let into a rabbit's eye, complete anæsthesia, with myosis, lasting for over three hours, will be produced. The applications referred to caused no local accident, and the doses employed were too small to have any effect on the system in general. Strophanthine, as prepared by Dr. Arnaud, was found to act in the same manner.

Two cases should be added to the nosological list of the Exposition. One is that of Virgile Pouan, who, never reading the papers, came to Paris to see the Exhibition a fortnight after it had closed. On being informed of the fact, and slightly laughed at by the hotel-waiters, he retired, and next morning was found strangled in his bed. In a note left on the night-table he said he would not survive his disappointment. The other case is less tragic. A woman at Reims has just given birth to a child bearing on its breast a beautiful wine-red image of the Eiffel tower.

PARIS, November 22, 1889.

VERATRUM VIRIDE IN EXOPHTHALMIC GOITRE.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Mrs. Bunnelle, wife of the agent at this place of Adams Express Company, applied to me for treatment July, 1879. Height, above medium; weight, ninety-three pounds; age, 35; mother of three children. Her condition: anæmic, greatly debilitated, heart apparently much dilated, without rhythm, with a wallowing movement; eye-globes so protuberant as almost preventing closure of lids, presenting shocking deformity. Goitre not measured, but very prominent. Mind deranged. She had suffered with this malady, gradually increasing in gravity, for twelve years. Had been under the treatment of several home physicians, and, finally, while visiting Philadelphia, consulted a physician of that city, who diagnosticated exoph-

thalmic goitre, and advised her to return home immediately, as she was liable to fall dead at any hour. I confirmed his diagnosis, and placed the patient on tr. veratrum viride, 3 drops morning and night, to be gradually increased until the full dose possible to tolerance was obtained. At first the 3 drops were barely tolerated; 4 drops produced such weakness as to oblige her to take to bed for a short time. She persevered, however, until 12 drops were taken morning and night without producing nausea or any inconvenience whatever.

This dose was continued twice daily for twelve months, then dropped to one dose daily for a few following months.

The improvement of the patient was gradual but progressive, and at the expiration of twelve months from beginning of treatment the goitre had disappeared, the eyeballs had receded to their normal position, the mind had returned, and her weight was ascertained to be one hundred and sixty pounds.

This lady was seen by me only at long intervals during her treatment, but she faithfully obeyed orders, and took the medicine with above results. She is now residing in this city, in the enjoyment of good health.

W. D. HUTCHINS, M.D.

MADISON, IND.

RHUS TOXICODENDRON.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In the October number of the THERAPEUTIC GAZETTE appears an article by Dr. John Aulde, entitled "Clinical Observations on Rhus Toxicodendron," in which the doctor seems to be of the opinion that he is a pioneer in the study of this remedy. He says that he found, on studying the history of the drug, "that it had been used only to a limited extent," which is undoubtedly true as regards our regular physicians, but it has been a favorite remedy with eclectics and homœopathists for years, and principally in rheumatic troubles

My attention was first directed to this remedy by reading the article on it contained in "Philips's Materia Medica and Therapeutics," published in the 1879 series of Wood's Library of Standard Medical Authors. Dr. Henry G. Piffard, the editor of the work, seems to have had considerable experience with it, and also speaks favorably of it.

Being desirous of trying it in practice, I could procure only the homœopathic mother tincture, and this preparation I have used in doses from the $\frac{1}{10}$ of a drop to a drop, and sometimes in even smaller doses than the above mentioned. Goss (eclectic) puts the dose of the tincture at 1 to 5 drops, and homœopathists, of course, use it in infinitesimal doses.

I think Dr. Aulde is doing a service in calling the attention of the profession to the remedy, but I wanted to show that it was not so entirely unknown in practice. Besides rheumatic affections I have used it in some skin-diseases, herpes, erysipelas, etc.

Respectfully yours,

C. C. STOCKARD, M.D.

COLUMBUS, MISS.

Notes and Queries.

PTOMAINES.

Among the recent advances in chemistry, none has been more full of interest to the pathologist than the strides made in our knowledge of the ptomaïnes and allied alkaloidal bodies. Numerous workers in this country and on the Continent are continually publishing fresh researches on the subject, and there is every indication that new and important discoveries may be expected in the future. The word ptomaïne has, however, been used in different senses. Selmi applied it to those products of putrefaction which give the reactions of plant alkaloids, and have more or less of a poisonous action. Brieger, who was the first to obtain pure crystalline products from the syrupy extracts of previous investigators, found that the bases isolated from putrefactive mixtures are less poisonous than those produced by pathogenic bacteria; he therefore termed these latter poisons "toxines," restricting the term "ptomaïnes" to the alkaloidal products of ordinary putrefaction. The toxines include those powerful poisons which he has named "tetanine" and "typhotoxine."

Further investigation showed that the products of metabolism of the higher organisms were not in general different from those of bacteria, and that poisonous alkaloids occur during life in the most highly-organized animals; choline and neurine had thus to be included among the ptomaïnes, and, later still, secondary toxic products of a simpler chemical constitution, such as methylamine, dimethylamine, etc., came under the same heading. The term "leucomaïne," introduced by Gautier, is now very generally applied to

the class of poisonous bases which is produced in the tissues of living animals by metabolic processes.

An important class of ptomaïnes are those which are termed "diamines," according to their chemical constitution. They are probably formed by oxidative processes from the monamines, and are found in small quantities in substances which have undergone very prolonged ordinary putrefactive decomposition; but what lends especial interest and importance to them from the pathologist's point of view is the fact that in cultivations of the cholera bacillus and of the Finkler-Prior vibrio they are readily formed in large quantities. It is exceedingly probable that in these substances Brieger is on the track of the true poison produced by bacterial energy in cholera. He has at present particularly studied two diamines, to which he has given the names "putrescine" and "cadaverine." Putrescine, to give it its chemical name, is tetramethylene-diamine ($C_4H_{12}N_2$), while cadaverine is pentamethylene-diamine ($C_5H_{14}N_2$). This latter substance has a strong and characteristic odor; it is, in fact, the odor of cholera stools. When the diamines are injected into the circulation they produce symptoms (hemorrhages and ulcerations) similar to those that occur in cholera; the muscular cramps and other prominent symptoms of that disease are doubtless produced by other toxines which have not yet been separated.

The investigation of diamines has been by no means exclusively carried on by Brieger, and among others the researches of Von Udránszky and Baumann demand special mention. They have recently published their results in a highly interesting and suggestive article in Hoppe-Seyler's *Zeitschrift für Physiologische Chemie*, vol. xiii. p. 562.

In a case of cystinuria, which was under their observation for more than a year after the removal of the calculus, the patient continued to void cystin crystals throughout the whole period. But the remarkable feature of the case was that during this time also the urine contained abundance of diamines; both cadaverine and putrescine were separated by chemical methods in a crystalline form, and the penta-compound (cadaverine) was always the more abundant.

Dupré and Bence Jones were the first to separate an alkaloidal substance from urine. Since then the question has been often discussed whether the ptomaïnes formed by putrefaction in the alimentary canal are partly reabsorbed and excreted in the urine. Leaving out of account creatinine, there has been, however, up till now, no satisfactory evidence that poisonous alkaloids occur in normal or pathological urine. In spite of this failure to isolate such toxic agents from the urine, many authors have not hesitated to assume that they occur, but have hitherto eluded detection. This assumption is, however, no longer necessary, for in a masterly research Stadthagen (*Zeit. Klin. Med.*, xv. Parts V. and VI.) has settled the question by showing that the poisonous substances in urine are inorganic potassium salts.

Diamines, certainly, are absent in normal urine; they are also absent in cases of acute and chronic cystitis, and in the urine of patients suffering from scarlatina, diphtheria, typhoid, pneumonic phthisis, and other suppurative processes. The urine and the blood of dogs and other lower animals are also free from diamines.

The case of cystinuria recorded by Von Udránszky and Baumann does not stand alone, for in two other cases Stadthagen and Brieger (*Archiv Path. Anat.*, cxv. Part III.) have found diamines in the urine.

Cholera and cystinuria have thus one circumstance in common, the formation of diamines, and in both diseases Von Udránszky and Baumann consider there is but little doubt that they are formed by the agency of microbes. The fæces of their patient were examined, and though cystin was absent, about half a gramme per diem of the two diamines was obtained; here, however, the tatra-compound (putrescine) was by far the more abundant,—that is, the opposite to what was found in the urine. This result, however, was not wholly unexpected, and is certainly a strong confirmation of the view that the poisons are produced by bacterial agency; for Brieger showed that when diamines are produced, first pentamethylene-diamine, and in the later stages of decomposition tetramethylene-diamine are formed. The penta-compound is here no doubt produced in the small intestine, absorbed in great measure, and then excreted in the urine; the tetra-compound is not formed until the large intestine is reached, and so is found in greater abundance in the fæces.

Diamines are absent in normal fæces, and in the stools of patients suffering from intestinal obstruction, typhoid fever, tuberculous ulceration of the intestines, and a large number of other diseases. Brieger and Stadthagen found them, however, in their two

cases of cystinuria. So that, both with regard to urine and fæces, the three cases are identical.

The question will, however, inevitably arise, How is it that these diamines give no characteristic odor to the intestinal contents, and produce no local action on the intestinal wall? This difficulty Von Udránszky and Baumann do not at present feel able to answer fully; more information is still wanting as to the quantity of diamines present in cholera, and researches on the effect of feeding animals on diamines are in progress. It is, however, probable that the bases are more greatly diluted by the urine and fæces in cystinuria than in cholera, and also that the bases are not present in the free condition but in combination. This latter view of the case is supported by the fact that both urine and fæces have an acid reaction.

Estimation of the amount of ethereal hydrogen sulphates in the urine of the same patient showed that their amount and relation to total sulphates were approximately normal. The amount of the ethereal sulphates in the urine is the best criterion we possess of the amount of putrefactive change occurring in the body. Thus, though there are no direct bacteriological observations, the conclusions which Von Udránszky and Baumann draw from purely chemical experiment appear incontrovertible. These conclusions are, first, that the diamines are produced by bacteria; and, secondly, that the bacteria which produce the diamines are not those which cause the usual putrefactive changes in the alimentary canal.

Certain other deductions, however, made by these two observers we are not at present prepared to accept so fully. They say that if the formation of diamines in the alimentary canal of patients suffering from cystinuria is found to be constant it may ultimately turn out that cystinuria or diaminuria is, like cholera, though to a less degree, an infectious disease. Although this suggestion is full of interest and likely to stimulate further investigation, it must, we think, be patent to all that the evidence in its favor is as yet inconclusive, and the verdict must remain for the present "not proven."—*British Medical Journal*, October 26, 1889.

HYPERPYREXIA IN HYSTERIA.

The *Centralblatt für Klinische Medizin* (*Lancet*, Oct. 12, 1889) translates from a Danish medical journal a notice of a case of hysteria, with a rise of temperature to 113° occurring in the practice of Dr. Lorentzen. The patient was a nervous woman, who, after an attack of hæmoptysis, suffered from severe dyspnœa, with cyanosis and temporary asphyxia, several times during the night; after the attack the patient lost consciousness for some time, and was then anxious and inclined to hallucinations. During the next two months she had, without any signs of phthisis, repeated attacks of hæmoptysis, with a repetition of the symptoms connected with the respiratory organs, added to which there was retention of urine. The temperature varied for three days from 103° to 104° F.; on the fourth day at noon it rose to 113°. Dr. Lorentzen found the patient without any other symptoms of inflammation, but slightly delirious; the temperature an hour afterwards had fallen to 108°, and in the evening it was 106.3°. The next day, after some paroxysms of dyspnœa, the temperature rose again to 113°, but fell in an hour to 99.5°. It varied in the next few days from 101.3° to 103.1°, and then became normal. The author considers the hæmoptysis without the slightest lung-affection as neuropathic, and the rise of temperature as hysterical, as there was no organic disease, and the respiratory disturbance was typically hysterical. It may be remarked that Teale found the temperature in a hysterical patient 122°, and Wunderlich 109.4°.

HOW MUCH SHOULD A CITY PAY ITS HEALTH OFFICER?

The Michigan State Board of Health has recently published a paper by its secretary, Dr. H. B. Baker, in which he asks the question how much the average city or village can afford to pay its health officer. He answers this question in this way: Statistics which cannot be questioned prove that in those localities in Michigan, where the recommendations of the State Board of Health are carried out, about eighty per cent. of the deaths from diphtheria and scarlet fever are prevented by the thorough isolation of all infected persons and the thorough disinfection of all infected persons, things, and places. Statisticians usually value a person in the prime of life as worth to the community about one thousand dollars. Dr. Baker thinks that in a village of fifteen hundred inhabitants a health officer can easily save the lives of two children and one grown person in each year, and he concludes that such a village can well afford to

pay its health officer two thousand dollars for the prevention and restriction of scarlet fever, diphtheria, and typhoid fever,—and make money by the transaction.

SULPHONAL AS A NARCOTIC.

According to the Paris correspondent of the *British Medical Journal* for October 12, 1889, M. RAYMOND has recently tested, at the St. Antoine Hospital, the value of sulphonal as a narcotic. Though far from being an ideal narcotic, it proved useful in many cases. It had scarcely any action on the respiratory system; on the circulatory system it had the same influence as sleep when this was natural; the temperature was slightly lowered. The secretion of urine was increased; that of the sweat-glands diminished. The tongue and mouth were sometimes dry; occasionally, though rarely, the patient vomited. M. Raymond found that sulphonal was not anæsthetic; it had sometimes a hyperæsthetic action. Small doses had no influence on muscular contractility; doses of 6 grammes (90 grains) were followed by ataxic movements of the limbs. Doses of 1 or 2 grammes (15 or 30 grains) were safe; women were more easily affected by sulphonal than men. Progressively increasing doses were unnecessary. After a certain time it could be discontinued; sulphonal was superior to morphine in this respect. It was especially useful in insomnia resulting from general debility, neurasthenia, and cerebral disturbance; where there was actual cerebral lesion the action of sulphonal was more intense, and in such cases it had to be administered with great care. Sleeplessness from abuse of morphine was relieved by sulphonal; it was also useful in phthisical patients who were rendered sleepless by coughing. It was inert when sleeplessness resulted from rheumatic pains, sciatica, cardiac troubles; also in Bright's disease and intense dyspnœa. Sleep produced by sulphonal was calm, lasted from six to eight hours, and came on about half an hour or one hour after administration. The disadvantages attending the use of sulphonal were fatigue, giddiness, and sometimes positive vertigo.

A CASE OF ACUTE ANTIFEBRIN-POISONING.

DR. MARECHAUX reports in the *Deutsche Medicinische Wochenschrift* for October 10, 1889, a case of a child 5 months old suffering from intestinal catarrh, who was ordered a powder composed of calomel, 1/6 of a grain; antifebrin, sugar, and powdered chalk, each 5 grains, to be divided into five powders, of which a half-powder was to be taken every three hours. Through a mistake of the druggist the powders were made up of 7½ grains of antifebrin, ¾ of a grain of calomel, and 7½ grains of sugar, and of this powder the half was given, or four grains of antifebrin, to the child at half-past seven. According to the report of the mother, at ten o'clock—that is, two and a half hours later—the entire body of the child was blue, the eyes were turned up, and the child was absolutely insensible. When Dr. Marechaux saw the child at two o'clock it then presented a high degree of cyanosis of the entire body, deep blue coloration of the lips and nose, hands, ears, and body cold. The eyes were half-open and eyeballs rolled up. The pupils did not react to light. Respiration was superficial,—72 in a minute; the pulse was almost imperceptible and 160 beats in a minute; the skin felt cold, its elasticity was diminished, and there was a slight cold, sticky sweat; the tongue was grayish white and moist. In attempting to give the child some water, movements of swallowing were made, but without success. Dr. Marechaux directed that every hour a teaspoonful of Hungarian wine should be given in an attempt to combat paralysis of the heart, while the entire body should be wrapped up in a damp woollen cloth to favor the secretion of sweat.

At four o'clock—that is, eight hours after the ingestion of the antifebrin—the child was in a profuse sweat, which had even soaked through the woollen cover. The skin felt warm and had regained its elasticity, the nose and extremities were warm, the pulse and respiratory movements were unchanged. The eyes were now unclosing; the pupils reacted slowly to light. The hearing as well as vision did not appear to have suffered, since the child followed persons with its eyes and turned its head towards a sound; the temperature was 98.9° F. At eight o'clock in the evening, the wine still being continued, and the child having taken with relish milk and water, there was decided improvement in the symptoms. Respiration was deeper and quieter and 60 in a minute, while the pulse had fallen to 130; there was a slight sweat, and abundant evacuation of thin, greenish, fetid stools, which was evidently due to the action of the calomel. There was no retention of urine and no vomiting. During the night the diarrhœa was

repeated a number of times, but on the next morning the child was practically well. Pulse 110, and respiration normal and 36 in the minute. No other symptoms of poisoning remained or subsequently appeared. The author attributes the rapid cure in this case to the simultaneous administration of the calomel.

MOORE'S TREATMENT OF ANEURISM.

The case to which reference was made at the meeting of Governors of the Royal Hospital for Diseases of the Chest, on Monday, was read by DR. W. H. WHITE and MR. PEARCE GOULD at a meeting of the Royal Medical and Chirurgical Society on April 12, 1887. The patient, aged 48, had noticed a swelling of the front of his right chest for five months before he came under Dr. White's care. Two months later, dyspnœa on exertion and cough supervened. On his admission to the hospital, November 20, 1886, a prominent swelling was found in the position of the right mamma, extending from the second to the fifth rib, and from the edge of the sternum to the axilla. It was the seat of a forcible expansile pulsation, and over it was heard a harsh systolic murmur. Till the middle of January the patient was kept in bed on restricted diet, taking 15 grains of iodide of potassium three times daily. Suddenly he became much excited, and the swelling increased rapidly in size and became very prominent. On January 11, Mr. Pearce Gould passed thirty-two feet of steel wire into the aneurism through a Southey's canula, introduced in the third intercostal space. Much blood was lost during the operation, but the hemorrhage was stopped by a pad of lint. The tumor became harder and the pulsation more heavy in character, and from one of the two punctures made at the operation serum drained in considerable quantities for several days. On January 17 the pad of lint was fastened on more firmly. Next day there was observed great swelling of the subcutaneous tissue over the aneurism. On January 19 the skin was found to be gangrenous, and the patient died. The first part of the arch of the aorta was greatly dilated, and a sacculated aneurism sprang from its upper part. The intrathoracic part of the tumor had a distinct though thin sac, but that portion which protruded from the chest was destitute of a definable sac, and was limited by infiltrated muscle. The wire, mixed with loose fibrinous clot, proved a very dense mass nearly filling the sac, to which, however, it did not adhere. The fatal result appeared largely due to the absence of a distinct sac to the outer part of the aneurism, and to the effects of the formation of a hard, solid mass in the aneurism, combined with rather firm external pressure applied for the arrest of the serous oozing. Dr. White and Mr. Gould believed that Moore's treatment was worthy of further careful trial in properly selected cases. The operation should be performed before there is reason to suspect rupture of the sac; only a small quantity of wire should be introduced at any one time, and no firm pressure should be made over the aneurism afterwards. Mr. Moore's original case occurred in 1864. Only two "Moore's operations" have been followed by complete recovery.—*British Medical Journal*, October 12, 1889.

THE USE OF COLCHICINE IN OCULAR THERAPEUTICS.

An ocular affection of the gravest character, marked by injection of the sclerotic, frequently assuming a chronic form, and accompanied by the formation of points of infiltration in the corneal tissue, may often be met with. In most of these cases the iris will likewise be affected, will be thickened, and the seat of exudations which will cause it to adhere to the surface of the crystallized lens; if not subjected to treatment, progressive irido-scleritis will follow. In many of these cases it is nearly impossible to positively recognize the nature of this affection. In many cases it will occur in rheumatic subjects, in others those who are affected with gout, while in other forms it would be difficult to decide whether the subjects are of a rheumatic or a gouty diathesis, or whether they belong to the number of cases affected with an ordinary form of chronic scleritis. After having prescribed salicylate of sodium and lithium for a long time in vain, DR. ABADIE writes, in the *Journal de Médecine de Paris* for September 22, 1889, that at the special request of Dr. Darier he has employed colchicine in these cases in doses of two to four granules per day, each consisting of $\frac{1}{64}$ of a grain of colchicine. Dr. Abadie states that in the cases thus treated he has obtained satisfactory results, and that he has frequently cured many cases which had been treated for long periods with other medicines without success before having recourse to the colchicine. The author states that he had previously, although with great timidity, made

use of the tincture of colchicum, but that he had never exceeded doses of 20 or 30 drops per day. While being able to state that the influence of this remedy was somewhat favorable as a curative power, it was much less than that of colchicine, which he regarded as almost an actual specific for these ocular lesions.

NAPHTHALIN IN TYPHOID FEVER.

Dr. C. Sehrwald has made some bacteriological experiments in Professor Rossbach's laboratory, from which he draws the following conclusions: 1. Naphthalin retards but slowly in the temperature of a room the development of the bacilli of putrefaction of fæces and of typhoid. 2. Naphthalin, finely powdered and well spread, or in solution and continually shaken, has its disinfecting power increased. 3. In a temperature of 98° the effect of naphthalin is much more powerful, which makes it highly probable that it is chiefly in its gaseous state that it destroys the germs. 4. Gaseous naphthalin in solution has more effect on aërobic than on anaërobic bacilli, and more on germs cultivated in a solid medium than on those cultivated in liquid. 5. The conditions for the full effect of naphthalin are much more favorable in the intestines than in the test-glass. 6. Naphthalin added to fæces decreases their germs by about a half, but, administered internally, it first decreases them to one-third, or even a quarter; after this, however, their number rises again almost to its original figure. 7. Against the bacilli of typhoid stools naphthalin is considered still more effective, and decreases the number of the germs even to one-tenth. 8. The administration of naphthalin should be commenced at the very beginning of typhoid fever. 9. As calomel affects some of the fæcal bacilli, while others are more readily destroyed by naphthalin, it is best to give, whenever possible, both drugs combined.—*Lancet*, September 28, 1889.

CONCERNING SOME NEW DERMATOLOGICAL REMEDIES.

Salol, oxynaphthoic acid, salicylate of mercury, and anthrarobin are the new remedies which Schwimmer reports upon (*Wiener Medizinische Wochenschrift*, 1889, Nos. 3 *et seq.*). Salol he used in one hundred cases. Twenty-five of these were simple venereal ulcers, of which twenty-three were healed and two were not. The average duration of treatment of those that got well was twenty-six days, the longest duration having been fifty days, and the shortest twenty-six days. Fifteen cases were of chancroids with bubo. The results were various, some cases doing well and some being uninfluenced, the latter being those in which suppuration was profuse. Thirty-five initial lesions were treated with the drug. In some cases remarkably prompt healing was effected, the normal condition being reached in two or three weeks. He found that the best results were attained by powdering the floor of the ulcer with salol and covering the edges with mercurial plaster. In ten cases of ulcerating syphilides the drug was found to be useful applied in powder. In fifteen cases of simple ulcer of the leg, salol failed to cure one. Schwimmer concludes from these experiments that salol may be used as a substitute for iodoform, though not so efficacious in all forms of venereal ulcers, especially is it devoid of smell. It is best applied as a powder,—2 parts to 1 of starch. Oxynaphthoic acid is a white, odorless powder of bitter taste which is insoluble in water, but freely soluble in warm glycerin and ethereal and fatty oils. This was tried in venereal ulcers, scabies, and other animal parasitic affections, and prurigo. In ten cases of venereal ulcers the results were unsatisfactory. In scabies its action was so prompt that Schwimmer now uses it as his only remedy, employing an ointment of 10 parts each of oxynaphthoic acid, white chalk, and green soap to 80 or 100 parts of lard. It causes no irritation to the skin, and cures in three or four days. No constitutional effect was noticed. The ointment is rubbed into the affected parts and then starch is powdered on. This is repeated twice daily, and a bath is taken at the end of the fourth day. In prurigo it lessened the itching, and healed the excoriations in a five or ten per cent. ointment. The salicylate of mercury was used as an injection of one one-hundredth of one per cent. strength in twenty-five cases of gonorrhœa, but was not satisfactory. In venereal ulcers it was used as an ointment in the strength of about two grains to the ounce, with fairly satisfactory results. It was tried in seventy cases of constitutional syphilis, and showed itself as a valuable remedy. It soon enters into the circulation and is prone to cause stomatitis. It was administered both as a powder and pill, and in the following combinations:

℞ Salicylate of mercury, gr. viiss;
Tincture of opium, gtt. iss;
White sugar, gr. xlv.
To be mixed and divided into 10 powders; 1 to be given twice a day.

℞ Salicylate of mercury, gr. xv;
Tincture of opium, gtt. iii;
Extract of gentian, q.s.
To be mixed and divided into 20 pills; 1 to be given two or three times a day.

Besides causing stomatitis, it also may give rise to erythema and urticaria. Anthrarobin was used in twelve cases of psoriasis, four of herpes tonsurans, six of eczema marginatum, and two of pityriasis versicolor. In psoriasis it was found of little use, being much less active than chrysarobin, pyrogallol, or white precipitate. In the parasitic diseases it acts promptly in a ten per cent. solution in collodion.—*New York Medical Journal*, October 12, 1889.

ATROPINE IN ENURESIS.

In the *Archives of Pediatrics* for October, 1889, Dr. William Perry Watson reports thirty cases of incontinence of urine occurring in children from 15 to 3 years of age, in nearly all of which cure was produced by the use of sulphate of atropine. The solution was composed of one grain of atropine to an ounce of distilled water, and 1 drop of this solution was given for each year of the age of the child. It was given at four and seven o'clock in the evening. Some of these cases occurred in Dr. Watson's private practice, and others in the public institutions which were under his care.

LIPANIN AS A SUBSTITUTE FOR COD-LIVER OIL.

According to the Vienna correspondent of the *Medical Press* (September 11, 1889), Dr. Galatti, of the Polyclinic, speaks highly in favor of this substitute for cod-liver oil, which has been used at the Children's Hospital for some time past. The results obtained appear to be very satisfactory from the report of that institution, as Dr. Herz says that lipanin is relished by the children; that uneasiness, hiccough, vomiting, or diarrhœa are not produced by its use; that the body rapidly increases in weight; that the appetite is rapidly improved, or rather a new appetite is created where before there was none; that in cases of tuberculosis the pulmonary condition is greatly improved by its use, the weight of the body is increased, and the general condition improved. This adjunct has the advantage of being used in the warmth of summer without any discomfort. The dose is 1 teaspoonful twice or three times a day, which may soon be increased to a dessertspoonful. To flavor it, Galatti uses it with an essential oil, as mentha anis or the syrup of auranti. In cases of rachitis it is combined with phosphorus, etc., but the great drawback to the use of this, as of many other drugs, is the price, as it is a costly drug.

THE INFLUENCE OF ABDOMINAL AND LUMBAR MASSAGE ON THE RENAL SECRETION.

Poloubinski has recently studied the influence of massage on diuresis, and his results, which indicate that massage of the abdominal region increases the urinary secretion, are published in the *Bulletin Général de Thérapeutique*, October 15, 1889. Experiments have been made upon ten individuals whose renal organs were perfectly normal. During the entire duration of these experiments the diet of these persons was precisely the same in all cases. The abdomen was subjected to massage daily, the duration of each *séance* being about half an hour. The author thinks that the massage not only increases the quantity of urine, but also the solids, urea, and especially the nitrogen eliminated in the urine. Massage of the lumbar region had no influence whatever upon the urinary secretion.

ELASTIC TISSUE.

Dr. Galin had made some experiments in the laboratory of Professor W. W. Podvysotski, in Kieff, on elastic fibres, which led him to the conclusion that the elastic tissue can be saturated by a foreign substance circulating in the blood and tissues. This occurs not only when the whole system is saturated with the substance and the organs of excretion are inactive, but also when such saturation does not take place and the kidneys are acting normally. These experiments, as well as those of Blashko, throw a new light on the physiological importance of the elastic tissue, and suggest that it serves as a kind of depot for the storage of septic and foreign substances, especially when their free excretion—by the kidneys, for instance—is in any way disturbed.—*Lancet*, October 12, 1889.

THE USE OF SUNFLOWER IN MALARIAL FEVERS.

In the *Bulletin Général de Thérapeutique* for October 15, 1889, Dr. Kazatchkoff calls attention to the fact that in the Caucasus and in the regions of the Volga the inhabitants are in the habit of employing the sunflower (*Helianthus annus*) in the treatment of malarial fevers. The method of employment seems to be to spread the leaves upon a bed covered with a cloth, to moisten them with warm milk, and then to wrap the patient up in the spread. Perspiration is thereby produced, and the patient is kept in this condition for an hour or two. The same process is repeated every day until the access of the fever has ceased. According to the author, only five or six days are necessary to produce a cure. Infusions of the flowers and parts of the stem are also used internally.

THE NATURE AND LIMITATION OF TREATMENT FOR UTERINE FIBROIDS.

At the last annual meeting of the American Gynæcological Society, "The Nature and Limitation of Treatment for Uterine Fibroids" was the title of a paper read by Dr. P. F. Mundé, of New York (*New York Medical Journal*, September 28, 1889). There were many cases of uterine tumor in which no treatment was required. Referring to the usual classification of uterine tumors, it was noticeable that those of the subperitoneal variety were seldom accompanied by hemorrhage; those of the submucous and interstitial varieties frequently were. The treatment for the subperitoneal variety, in cases in which treatment of a surgical character was required, would consist in removal of the uterus with the tumor, or in removal of the ovaries alone. In the interstitial variety the tumor could often be removed without removing the uterus; in the submucous variety the tumor alone would require removal. If the tumor was not removed, ergot or electricity might be substituted, the object being to force the tumor as far as possible into the pelvis. The greatest difficulty was to be expected in attempting to remove sessile fibroids seated near the fundus through the undilated utero-vaginal canal. The German method—of performing laparotomy and removing the tumor through the opened uterus—was, perhaps, preferable in such cases. Hemorrhage accompanying uterine tumors might be treated with the curette or by electro-puncture through the vagina. It was maintained for the latter, which was Apostoli's method, that it would cause the tumors to cease growing, but this cessation was not permanent. In the three cases in which the author had performed oöphorectomy for the relief of the uterine tumors, the results had been satisfactory. In six cases in which subperitoneal tumors had been removed through the abdomen, recovery had taken place in four; in all cases the pedicle had been treated by the extraperitoneal method. Tumors which were seated near the os internum tended to dilate the os, and in many cases no treatment would be required. In some cases in which operation was indicated, they could be enucleated and drawn out after the capsule had been split. Laparotomy should not be performed if a tumor was causing no serious trouble, and no operation was indicated in most cases in which the menopause was imminent.

THE CURABILITY OF CIRRHOSIS OF THE LIVER.

In the formulation of the prognosis in cirrhosis of the liver, Professor Semmola maintains that the greatest value may be attached to the estimation of the amount of urea eliminated daily (*Wiener Medizinische Wochenschrift*, October 5, 1889). He writes that his experience in seven closely observed cases has warranted him in making the positive statement that an increase in the amount of urea daily eliminated indicates a favorable prognosis, while a decrease in the amount of urea is much more unfavorable. The amount of urea eliminated is proportional to the functional activity of the liver-cells, and the larger the number of active liver-cells or the higher the activity of the hepatic tissue, the greater will be the percentage of urea in the urine; and, conversely, the more inactive is the liver the less will be the decomposition of albuminoids, the less the amount of urea excreted. As a consequence, then, Professor Semmola believes that from the amount of urea the degree of the affection may be absolutely established and an unfavorable prognostic sign recognized. As regards the treatment of cirrhosis, the author highly recommends an exclusive milk diet in ascites as a consequence of cirrhosis of the liver, while this does not hold good in cases of ascites from other causes.

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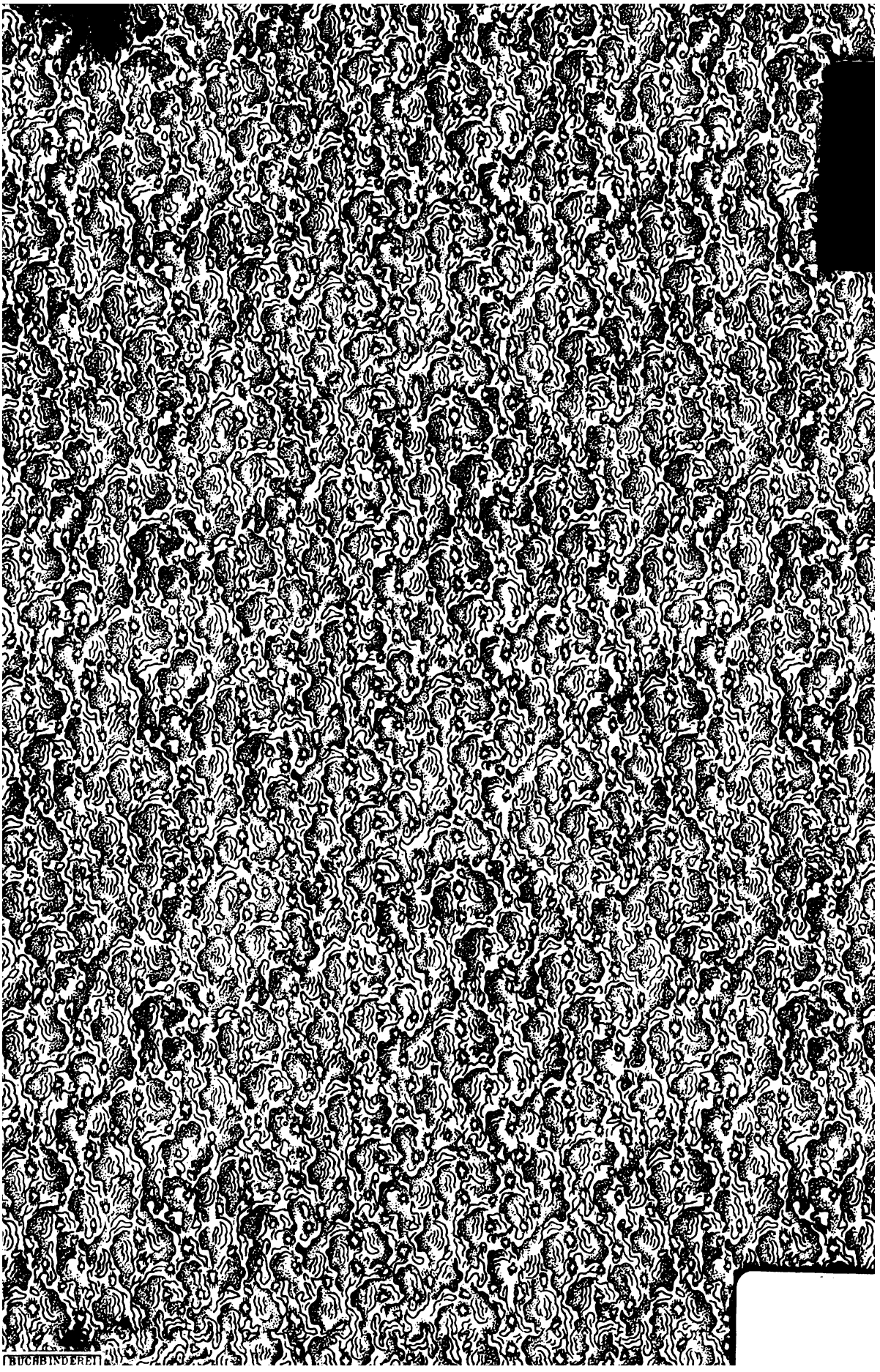
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